SPRING 2004

Harvard Medical

ALUMNI BULLETIN



EARTHLY TREASURES

When the land failed to yield a mineral precious to health, one man's vision replenished soil, water, and hope.



LUMINARY

1893

Alice Hamilton—a pioneer in the study of diseases of the workplace, a social justice activist, and a founder of industrial toxicology in the United States—became the first woman to join Harvard Medical School's faculty when she was appointed assistant professor in 1919. She is pictured here the year she graduated from the University of Michigan Medical School, at the age of 24.

SPRING 2004 • VOLUME 77, NUMBER 3

CONTENTS



DEPARTMENTS

Letters 3

Pulse 5
The Second Year Show; continuing medical education online; the new Harvard Stem Cell Institute; *U.S. News and World Report* rankings; a medical mission to Iran in the aftermath of the Bam earthquake; Match Day 2004

President's Report 12
by Eve J. Higginbotham

Bookshelf 13

Benchmarks 14
Fatty-acid imbalance emerges as a new clue in the fight against cystic fibrosis.

Class Notes 56

Obituaries 61

Cover photograph: A young Kyrgyz bride awaits her wedding in the Xinjiang Uighur Autonomous Region of China, where as many as one in ten children suffer from the debilitating symptoms of severe iodine deficiency disorders. *(Nevada Wier Corbis)*

FEATURES

Water Under the Bridge 16
A neurologist turns to hydrology, agronomy, and veterinary medicine to tackle the world's most preventable cause of mental retardation.
by GORDON WORLEY

Pickwick Revisited 24
The sharp clinical eye of Charles Dickens inspired a physicianly borrowing—and sparked the imaginations of researchers dedicated to unraveling the mysteries of sleep disorders.
by PETER V. TISHLER

Initiation Rites 32
A physician and the Navajo community she serves struggle to make sense of each other's blessings and imperfections.
by ELLEN L. ROTHMAN

Gloves Off 40
A surgeon turns to writing to help dissect the medical profession.
an interview with ATUL GAWANDE, *by* ELISSA ELY

The Case of the Canine Caper and Other Tales 44
Panting pooches, hidden heartbeats, perilous peregrinations, and wiggly worms figure in one physician's collection of whimsical medical memories.
by SAMUEL POTSUBAY

Joint Ventures 50
Harvard's Surgical Research Laboratory has closed its doors after nearly a century of advances that boldly transformed the way medicine operates.
by NICHOLAS L. TILNEY AND MARY GRAVES TILNEY



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In This Issue

A MAN IN A SURGICAL MASK IS ARRESTED. A NEW WONDER DRUG, PENICILLIN, is dropped by parachute to save a Native woman in the Canadian north. Harvey Cushing's chauffeur delivers a therapeutic shake to the eminent neurosurgeon's dog. And a Navajo man in a wheelchair lectures teenagers about the perils of alcohol, only to die a few months later, lying drunk in the cold of an Arizona night.

The stories in this issue came to us from alumni and faculty from several generations and across the country. Yet it should come as no surprise that some common themes emerge. Certainly one of them is the extraordinary history of innovation at HMS. Another is that even the Harvard luminaries who now appear to represent a kind of monolithic, marble tradition were engaged in all kinds of rebellion and conflict, which were essential to the vitality of the institution.

What strikes me in reading these articles, however, is how poignantly they illustrate a phenomenon so pervasive and apparent that the emotional punch of the facts is lost in the piety of their expression: how often privilege, or the lack thereof, trumps medical science. Yet an engaging counter-theme emerges in these same pieces: swimming against the tide is far from a hopeless endeavor. Individual physicians faced with seemingly intractable problems can embrace the challenges and, on occasion, prevail.

As I have noted before in this space, the *Bulletin* is primarily the product of HMS alumni. Unlike the magazines coming from virtually any other medical school, we stick to a long tradition of publishing, as much as possible, in the voices of our graduates. That said, we depend on a small and stellar staff of editor-writers to sustain the quality of the magazine. Thanks to their efforts, the *Bulletin* has again won a gold medal (in a field of 76 graduate school magazines) from CASE, the Council for Advancement and Support of Education. Along with Editor Paula Byron and Associate Editor Beverly Ballaro, Susan Cassidy as assistant editor had contributed to this effort. Susan has now moved to another post at Harvard, and we take this occasion to thank her and wish her well. Janice O'Leary, who succeeds her as assistant editor, arrives with this issue, and we welcome her.

William Ira Bennett

A Timely Prescription

I am responding to the forward-looking and thought-provoking "President's Report" written by Mitchell Rabkin '55 in the summer issue of the *Bulletin*. In that column, Dr. Rabkin advocated the creation of a nursing school at Harvard. I write to endorse his proposal in the strongest possible terms, but for somewhat different reasons than he set forth.

Dr. Rabkin pointed out, quite appropriately, that the shortage of registered nurses is already a major threat to the quality of health care. In the future this shortage could impose a catastrophic limitation on our ability to deliver high quality care. I do not believe, however, that this workforce issue should be the primary inspiration that leads Harvard to create a nursing school. Rather, Harvard should create a school of nursing because nursing has become an established and increasingly important academic discipline.

Nursing research has now been recognized by the creation of the National Institute of Nursing Research, one of the 27 institutes comprising the National Institutes of Health. Peer reviewed funding is even more highly competitive in nursing research than in the other research areas of the NIH. Nursing scholarship in areas such as medical anthropology, ethics, end-of-life and palliative care, psychosocial nursing, and pain management constitutes some of the strongest work in the field. All these areas desperately need research of the quantity and quality one expects from Harvard. Simply put, Harvard should create a nursing school because nursing is a major area of scholarship to which Harvard contributes less than it could and should.

A number of outstanding nurse/scholars do call the Harvard community home. They have achieved international impact despite being handicapped by having no nursing school of their own, no dean to advocate for their area, and no internationally preeminent board of overseers to serve as their advocates and advisors. They contribute without the leverage for extramural research resources that only an organized school can bring to a major academic discipline. The accomplishments of these nursing leaders are, therefore, all the more remarkable. Imagine what impact they could have if they had Harvard's imprimatur.

It is instructive to survey the status of nursing at the other universities whose schools of medicine rank in the top tier in the United States. Schools that rival Harvard Medical School—such as Johns Hopkins, the University of California at San Francisco, the University of Pennsylvania, the University of Michigan, the University of Washington, Case Western University, and yes, even Yale—all have outstanding schools of nursing as partners. All are producing leaders who are influencing health care, shaping public policy, and altering the direction of biomedical research in areas such as pain and palliative care, symptom management, complementary and integrative medicine, patient safety, and psychosocial oncology. Harvard is being left behind—and that is why we should have a school of nursing.

EDWARD J. BENZ, JR. '73
BOSTON, MASSACHUSETTS



"Nursing scholarship in areas such as medical anthropology, ethics, end-of-life and palliative care, psychosocial nursing, and pain management constitutes some of the strongest work in the field."

—EDWARD J. BENZ, JR. '73, PRESIDENT, DANA-FARBER CANCER INSTITUTE

Conserving Compassion

My memorial for Neil Ghiso '01, published in the Summer 2002 issue of the *Bulletin*, prompted an outpouring of support for Neil's family and friends, as well as for the newly created Neil Samuel Ghiso Foundation for Compassionate Medical Care.

I had mentioned in the memorial that the foundation was created to foster compassionate care for chronically and terminally ill patients and their families through medical education and training. As a follow-up for your readers, I would like to report that two very talented third-year HMS students, David Hwang '05 and Richard Lin '05, were named the first Neil S. Ghiso Foundation fellows this year. The fellowship, which was created with support from numerous HMS alumni, provides an opportunity for medical students to work with terminally ill patients in order to develop their own clinical skills in end-of-life care and to conduct research projects aimed at identifying key issues in delivering quality care for the terminally ill.

The fellowship allowed David Hwang to spend one month working full time for the Massachusetts Compassionate Care Coalition, a statewide coalition to improve end-of-life care in the commonwealth. David worked with Compassion Sabbath, a multi-faith initiative to provide clergy with training, tools, and resources to address the spiritual needs of dying people.

Richard Lin, for his fellowship, developed a research project to identify the needs of residents in long-term care facilities and barriers to the delivery of good palliative care. Richard created a questionnaire-based interview study at the Sherrill House skilled nursing facility in Jamaica Plain, Massachusetts, to investigate the physical, emotional, psychological, and spiritual needs of residents in receiving palliative care.

Throughout his illness, Neil spoke about the critical importance of compassion in medical care. This concept was never more evident to those close to Neil than in his last months, when the quality of his life was determined far more by the kind care he received from his medical team than by the sophisticated medical technology that was made available to him.

Neil's family, friends, and colleagues hope that the foundation will honor his memory by providing opportunities for future doctors to recognize the unique needs of the terminally and chronically ill and to understand the critical role of compassion in caring for all patients.

LISA CATAPANO '03
WASHINGTON, DC

NEIL SAMUEL GHISO, 1970–2002



> "Throughout his illness, Neil spoke about the critical importance of compassion in medical care. This concept was never more evident to those close to Neil than in his last months, when the quality of his life was determined far more by the kind care he received from his medical team than by the sophisticated medical technology that was made available to him."
>
> —LISA CATAPANO '03

North Star

Although we were never intimates of our classmate Andy Embick '77 and did not maintain personal contact with him after leaving HMS, we were always fascinated by his destination of Alaska and by his multifaceted, rugged medical experiences there, described in his alumni updates. Thus, we were greatly saddened to read of his passing in the Great White North, and our prayers are with his family. For us, and we're sure for many of our classmates, our enduring memories of Andy are of his rappelling down the walls of Building A—chased by campus police—and cross-country skiing down Avenue Louis Pasteur on a snowy New Year's Eve.

ANDREA AND RAPHAEL COHEN '77
WYNNEWOOD, PENNSYLVANIA

The Bulletin welcomes letters to the editor. Please send letters by mail (Harvard Medical Alumni Bulletin, *25 Shattuck Street, Boston, Massachusetts 02115); fax (617-384-8901); or email (bulletin@hms.harvard.edu). Letters may be edited for length or clarity.*



CARTOON NETWORK: From faculty send-ups to a swaggering striptease, second-year students offered a comic take on HMS.

What Would Scooby Do?

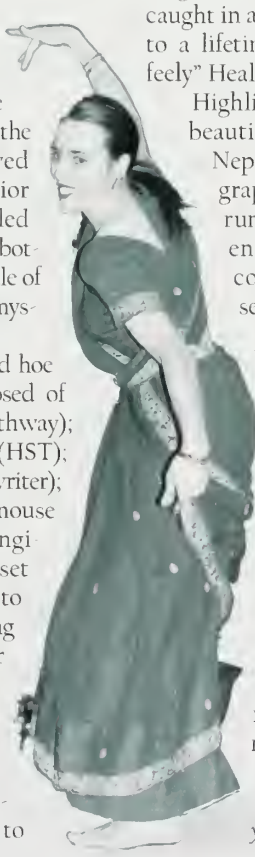
THIS YEAR'S SECOND YEAR SHOW, "Cremaster and Commander: The Inner Side of the Thigh," took theatergoers on a Mystery Machine tour of HMS—with Velma, Daphne, Fred, Shaggy, and, of course, Scooby along for the ride. The audience cheered on the cartoon-inspired characters through two action-packed hours of HMS-based satire that was definitely for adults only.

Directed by Stephanie Krejcarek and Christopher Russell, this year's show included unabashedly gratuitous (and thoroughly enjoyable) dance numbers, razor-sharp portrayals of some of the School's most famous faculty, and enough sexual innuendo to make Larry Flynt proud. Just as amusing was the hilarious, true-to-life commentary by Richard Schwartzstein '79 as parodied by Conor Kleweno in a convincing performance of the physiology course director and lung lover.

The tale unfolds as Dean Joseph Martin summons to his office Nancy Oriol '79; Shiv Pillai; Dana Stearns; Jeannie Hess; Paul Farmer '90 (complete with an adoring, youthful female entourage); and Cindy-Trudy-Sam—that is, Cindy McDermott, Trudy Van Houten, and Sam Kennedy, who throughout the show are literally joined at the hip. The dean has received reports of scandalous behavior by his faculty and has called them together to get to the bottom of the matter. In the middle of the meeting, though, Martin mysteriously disappears.

In true HMS fashion, an ad hoc committee is formed, composed of students Fred (New Pathway); Daphne (Dental); Velma (HST); Shaggy (a Second Year Show writer); and the requisite knockout mouse SCOobY (a genetically engineered obese mouse). They set out to find the missing dean, to solve the mystery, and, along the way, to write a murder mystery script for the Second Year Show.

The adept students soon find the one they believe to be the culprit—antibody-obsessed Shiv Pillai—only to discover that yet another faculty member has been kidnapped. Soon, nearly the entire faculty is gone, snatched by an unknown abductor, which sparks a chase to find the real villain.



Along the way, SCOobY and the gang watch Nancy Oriol and Bev Woo—portrayed by Jona Hattangadi and Emily Pinto-Wong—duke it out for student affection. They also see Jeannie Hess as played by Stephanie Krejcarek vamp across stage as a *Chicago*-style diva, and they witness an unlikely striptease by Dean Malcolm Cox '70 as played by the talented Ryan Dunlop. Finally, the villain—none other than physiology drill sergeant Richard Schwartzstein—is caught in a rousing finale and sentenced to a lifetime of teaching the "touchy-feely" Healer's Art class for his crimes.

Highlights of the show included beautifully performed traditional Nepali dance routines, choreographed by Ruma Rajbhandari; a running spoof on Paul Farmer endowed with a Messianic complex, which included a scene with Farmer—fittingly played by Ted Lord—dressed up as Jesus; and the musical number "Hit the Road, Plaque," a twist on the Ray Charles classic that will surely be seen in a toothpaste commercial in the near future.

Proceeds from this year's show will benefit the Martha Eliot Health Center Mentorship Program, which matches medical students as mentors with Mission Hill middle-school students. ■

Tarayn Grizzard '06 is a fourth-year medical student at HMS.



WEB FEAT: Sanjiv Chopra says that online CME modules will help extend medical learning to developing nations.

Cyber Case

CLINICIANS SEEKING CONTINUING MEDICAL education credits can now log on to Harvard Medical School's CME website from their homes or offices. Clinicians can pursue their credits during the gaps in their day, logging on and off at their convenience and saving their work from one session to the next.

More important, clinicians from around the world can take advantage of this service, says Sanjiv Chopra, faculty dean for continuing education and HMS professor of medicine at Beth Israel Deaconess Medical Center. Chopra cites a statement that Harvard President Lawrence Summers made during a grand rounds last year: "In the era of technology, we have an unprecedented opportunity, perhaps even a moral obligation, to share information and knowledge with colleagues around the world."

The School has worked to fulfill that obligation, offering 225 live CME courses and 400 in-hospital conferences, including grand rounds. But although approximately 30,000 clinicians attend these sessions, only 2,000 come from outside the United States, with most of these from Canada.

For clinicians from the wealthiest countries, the fee for online CME is $25 per credit. The rest of the world gets a 50 percent discount, and Chopra hopes—through endowment, perhaps—eventually to offer clinicians in developing countries much more substantial discounts.

Online CME provides more scope for learning than traditional venues, Chopra says. Whereas a grand rounds is generally restricted to an hour, an online module can be as long as necessary and can include any number of relevant visuals. "We can show the EKG of a typical car-

From the Laboratory to the Patient

SEVEN HARVARD SCHOOLS, seven teaching hospitals, and nearly a hundred researchers are banding together in an ambitious new institute with a common goal: to use stem cells to help the 150 million people nationally living with or dying from five types of organ and tissue failure.

To achieve its aims, the new Harvard Stem Cell Institute will mount the largest, most comprehensive effort of its kind. It will tap resources across the University, break new scientific ground, pioneer new medical treatments, identify significant nongovernmental funding sources, and wrestle with ethical, religious, and political ramifications.

Along the way, the institute will bring together isolated investigators who are already performing cutting-edge stem cell research, making Harvard one of the leading centers for this type of work in the world.

"The Harvard Stem Cell Institute is an important effort to help unlock one of the fundamental mysteries of life, and could lead to important new medical treatments," said Harvard President Lawrence Summers.

Stem cells, with their ability to develop into specialized tissue cells, have excited researchers with their promise. By understanding how they work, researchers hope they can learn to develop nerve, blood, bone, and other kinds of cells to be used to treat a wide spectrum of diseases.

The institute will encourage stem cell research on several fronts. Research into adult stem cells is the most advanced. These cells create specific tissue types, such as blood, nerve, or muscle. Blood stem cells are already being used in treatments, particularly for leukemia and other blood cancers. Work on adult and embryonic stem cells in animals, as a way to understand their function in humans, is also progressing rapidly.

Some of the most promising—and controversial—stem cell work is with human embryonic stem cells. Embryonic stem cells are unique because they can develop into any cell in the body. The Harvard Stem Cell Research Committee, established to review nonfederally funded research on human embryonic stem cells, will review research proposals before they go forward.

In addition to the research being conducted by investigators at the Faculty of Arts and Sciences, Harvard Medical School, and Harvard's teaching hospitals, the institute will draw on resources across the University to examine the ethical, political, religious, economic, and other ramifications of the research.

"Given the potential we have here, to not take advantage of it would be a tragedy in a way," said institute Co-Director and Harvard Medical School Professor David Scadden, who also serves as director of Massachusetts General Hospital's Center for Regenerative Medicine and Technology. "We hope to create a crucible in which these interactions among researchers will happen."

In its initial phase, the institute will be a "virtual" center, supporting research and drawing scientists together who work in laboratories that may be physically distant.

KEEPING THE STREAK ALIVE

IN ITS ANNUAL ROUNDUP OF THE COUNTRY'S BEST GRADUATE SCHOOLS, *U.S. News & World Report* has named HMS the number one medical school in the research category for the 14th year in a row. The School also took top ranking for its pediatrics and women's health programs, second place for its internal medicine and drug/alcohol abuse programs, and third place for its AIDS programs.

The schools that followed HMS among the top five overall were Washington University, Johns Hopkins University, and, tying for fourth place, Duke University and the University of Pennsylvania. ■

diac lesion," Chopra says. "We can show the cardiac echo, a hemodynamic tracing, and cardiac catheterization. We can let the natural history of the disease unfold, and we can show what we would be likely to see five years hence if the patient went untreated."

Within three months after the first module became available, and without any marketing, 129 clinicians from more than 20 countries had already taken advantage of the service.

"Our goal is to take the top 50 to 60 diagnoses that primary-care physicians deal with on a daily basis and develop modules for those first," Chopra says. Once that goal is achieved, he plans to move into the specialties.

Users log on to http://cme.med.harvard.edu, then select "CME Online." Then they choose from a smorgasbord of topics, such as "Clinical Challenges in Electrocardiography" or "St. John's Wort and Depression: What's the Evidence?" From there, they can review a sample case, or dive right into a module.

In the typical case, the users read the patient's history, analyze the results of a physical examination and laboratory tests, and then get a question with several possible answers. If they give an incorrect answer, they try again. If they give the right answer, they can still read the experts' advice about why the other responses are wrong.

In the sample case, the users find out that the patient—a 42-year-old woman with fever, flank pain, vomiting, palpitations, and escalating feelings of anxiety—has hyperthyroidism. They then review the disorders other than Graves' disease that can cause the condition. They view a goiter and are asked which physical exam findings provided in the lesson would support the diagnosis. The rest of the questions are followed by more information about the case.

Chopra is enthusiastic about the task. "I feel privileged," he says, "because I work with some of the most brilliant, ebullient, and dedicated faculty." ■

David Holzman is a freelance writer for Focus.



Researchers will develop core laboratory facilities and needed technology to perform functions such as cell sorting, imaging of stem cells in their natural environments, and the transfer of nuclei between cells.

Within a few years, Scadden and the institute's other co-director, Douglas Melton, the Thomas Dudley Cabot Professor in the Natural Sciences at Harvard, hope to add a central physical location for the institute, complete with laboratory facilities. Though some researchers would continue to work in their own labs at different locations, the physical closeness of a central lab facility should allow informal meetings and foster an environment that will lead to new ideas and lines of inquiry.

Although basic science is critical to the effort, Scadden said the institute's main goal is to develop scientific advancements into practical treatments for patients.

Howard Heffron, a graduate of Harvard Law School, donated $5 million toward the establishment of the new institute because, he says, he wanted to help fill the void left by the federal government. Stem cell research has promise to help people like his daughter Nancy, who has diabetes, and his close friend, the late Law School Dean James Vorenberg, who had Parkinson's disease.

The new institute is focused on five disease types for which stem cell therapy seems most promising. These diseases all result from some sort of organ or tissue failure: diabetes; neurodegenerative diseases; blood and immune diseases; cardiovascular disease; and musculoskeletal diseases.

Leonard Zon, an HMS professor of pediatrics at Children's Hospital and president of the International Society for Stem Cell Research, said other institutions such as Stanford University have already organized stem cell efforts, but few have the resources already present at Harvard.

"We have a tremendous intellectual community already existing, and when drawn together I think there will be nobody who can possibly touch us," Zon said. "I think the stimulation for the entire field will be tremendous." ■

Alvin Powell is a writer with the Harvard University Gazette.



PHOTO: OLI PETER/GETTY IMAGES

Rescue Heroes



MEMBERS OF THE INTERNATIONAL Medical Surgical Response Team (IMSuRT) in Boston did not expect their winter holiday to involve a voyage halfway around the world. But when a 6.8-magnitude earthquake struck Bam, Iran, on December 26, 2003, Susan Briggs, the supervising medical officer, and her team were deployed less than a day later.

Briggs, associate director of the trauma service at Massachusetts General Hospital and HMS associate professor of surgery, heads the team of 140 trauma specialists, surgeons, anesthesiologists, nurses, respiratory therapists, biomedical engineers, and paramedics. Together they make up the first rapidly deployable expert team equipped to establish a fully capable, freestanding field surgical facility anywhere in the world. Nearly 100 members of the team work at Harvard affiliates, and 58 of them made the journey to Bam.

"When I heard they were considering sending us to Iran, I didn't think we would be allowed in," says Briggs. Her team was the first to enter the country in an official U.S. government capacity since the 1979 Islamic Revolution.

"You couldn't set up in the center of town," says Briggs. "Seventy percent of it was destroyed." The earthquake claimed more than 26,000 lives and injured approximately 20,000 people.

Because of Iranian cultural traditions, IMSuRT had to improvise its standard setup and create separate treatment facilities for men and women rather than the usual acute and non-acute designations. Iranian women could only be treated by women, and all women were expected to have their heads covered in public.

"We had brought wool caps, but it got too hot to wear them during the day," Briggs says, "so we cut arm slings to use as hats."

IMSuRT treated 727 patients, performed seven operations, and assisted in six live births—two by Cesarean—in their 12-day stint in the field hospital. One of the babies, born prematurely at 32 weeks, had to be hand-ventilated by respiratory therapists for ten hours until the child could be med-flighted to Tehran for further treatment.

"We saw all kinds of injuries, including a lot of pulmonary problems because of all the dust," says Briggs, whose humanitarian medical relief work took her to Turkey following its 1999 earthquake.

Interpreters translated Farsi for IMSuRT members, but it was a combination of the language barrier and the devastation the Iranian people had faced that was most difficult for Briggs. "Some of them lost 20 to 40 family members. The language barrier made medical care and emotional support difficult to give."

Critical specialists, including Briggs, stayed in the field hospital around the clock. "We slept on the floor of the operating room and rotated people between tents in 12-hour shifts," she says.

Before they left on January 7, IMSuRT donated their entire hospital to the Islamic Red Crescent Society. "The most rewarding part," Briggs says, "was to see that politics was put aside to let us fulfill a need." ■

Leah Gourley is an editorial assistant at Focus.

Striking a Match

THE 52ND ANNUAL MATCH DAY, HELD MARCH 18, revealed to 175 HMS fourth-year students where they will be spending their residencies. Ninety-four percent of this year's graduating class chose to pursue clinical programs, with internal medicine as the most popular specialty, at 23 percent. Pediatrics was the second most popular specialty, at 12 percent, followed by radiology at 8 percent and ophthalmology and emergency medicine, both at 7 percent. Just over half of the fourth-years will remain in Massachusetts, and 94 percent of these will be at HMS-affiliated hospitals. California and New York drew a combined third of the class, with 21 and 12 percent respectively.



ANESTHESIOLOGY

Jordan Brand
New York Presbyterian Hospital (Cornell)

Tomas Cvrk
Massachusetts General Hospital

Boris Spektor
Massachusetts General Hospital

Michael Chiwei Su
Brigham and Women's Hospital

DERMATOLOGY

April Armstrong
Massachusetts General Hospital

Heather Brandling-Bennett
Massachusetts General Hospital

Elizabeth Buzney
Massachusetts General Hospital

Vinh Chung
Emory University, Atlanta

Jean Lee
Massachusetts General Hospital

Mayra Lorenzo
University of Massachusetts Medical School, Worcester

Laura Pincus
University of California–San Francisco

Michael W. C. Su
University of California–Davis Medical Center

Ryan Turner
Massachusetts General Hospital

EMERGENCY MEDICINE

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University Hospital, Cincinnati

J. Drew Colfax
Vanderbilt University Medical Center

James De La Torre
University of Southern California

Heidi Harbison
Brigham and Women's Hospital

Renee Hsia
Stanford University Programs

Jerrilyn Jones
Boston University Medical Center

Alexander Lam
Boston University Medical Center

Marisela Marrero
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Erick Miranda
University of Southern California

Tami Tiamfook
Brigham and Women's Hospital

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Swedish Medical Center, Seattle

Anje Van Berckelaer
Harbor-UCLA Medical Center Torrance, CA

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Eastern Virginia Medical School

Scott Damrauer
Massachusetts General Hospital

Jonathan Fox
Massachusetts General Hospital

Joaquim Havens
Brigham and Women's Hospital

Ugwuji Maduekwe
Massachusetts General Hospital

Travis McGlothin
University of New Mexico, Albuquerque

Joan Ryoo
Brigham and Women's Hospital

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Johns Hopkins Hospital

Sonali Bose
Mt. Sinai Hospital, New York, NY

Rebecca Breslow
Brigham and Women's Hospital

Supinda Bunyavanich
Massachusetts General Hospital

Jeffrey Chung
Massachusetts General Hospital

Lori Coburn
Vanderbilt University Medical Center

Adam Cohen
Good Samaritan Regional Medical Center, Phoenix

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Alden McDonald
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Taylor Ortiz
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Brian Turner
Brigham and Women's Hospital

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Ariel Weissmann
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Eric Williams
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Harvard/Massachusetts General & Brigham and Women's Hospitals

Michael Ty
Harvard/Massachusetts General & Brigham and Women's Hospitals

NEUROLOGY/PEDIATRICS

Catherine Chu
Children's Hospital, Boston

Suzanne Goh
University of California–San Francisco

NEUROSURGERY

Joseph Hsieh
University of Chicago

Rollin Hu
Harvard/Massachusetts General Hospital

OB/GYN

Christina Dancz
University of Southern California

Liyun Li
University of California–San Francisco

Shruthi Mahalingaiah
Brigham and Women's Hospital

Ngoc Phan
University of California–San Francisco

Amina Porter
Georgetown University Hospital

OPHTHALMOLOGY

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Tufts/New England Eye Center

Teresa Chae
Baylor College of Medicine, Houstan

Julie Chen
University of California–San Francisco

Susan Hoki
University of Southern California

Aaron Kuzin
University of Southern California

Dalia Nagel
Mt. Sinai School of Medicine

Yvonne Ou
University of California–Los Angeles

Harsha Reddy
University of Southern California

Lucy Shen
University of California–Los Angeles

Gregory Sulkowski
University of Illinois, Chicago

Sara Tullis
University of Miami/Bascom Palmer Eye Institute

Deborah Yeh
University of Michigan, Ann Arbor

ORAL AND MAXILLOFACIAL SURGERY

Killian MacCarthy
Massachusetts General Hospital

Steven Smullin
Massachusetts General Hospital

Derek Steinbacher
Massachusetts General Hospital

ORTHOPEDIC SURGERY

Julius Bishop
Harvard/Massachusetts General Hospital

Sumeet Garg
Barnes-Jewish Hospital, St. Louis

Coleen Sabatini
Harvard/Massachusetts General Hospital

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NYU School of Medicine

Stephanie Misono
University of Washington, Seattle

Andrew Scott
Harvard Programs

PATHOLOGY

Samuel Katz
Brigham and Women's Hospital

Vikram Kumar
Brigham and Women's Hospital

PEDIATRICS

Kathryn Brinner
Massachusetts General Hospital

Janet Chou
Children's Hospital, Boston

Katharine Creskoff
Children's Hospital, Boston

Andrew Dauber
Children's Hospital, Boston

Michelle Day
Massachusetts General Hospital



Kevin Friedman
University of Colorado School of Medicine, Denver

Noelle Johnstone
Stanford University Programs

Rebecca Locke
New York Presbyterian Hospital (Columbia)

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University of California–San Diego Medical Center

Sallie Permar
Children's Hospital, Boston

Lynn Ramirez
University of California–San Francisco

Paul Rosenau
University of Vermont/Fletcher Allen Hospital, Burlington

Kristi Stanton
Children's Hospital, Boston

Jeremy Tucker
Baylor College of Medicine, Houston

Sabrina Vineberg
Johns Hopkins Hospital

Scott Weiss
Children's Hospital, Boston

Katharine Zuckerman
Massachusetts General Hospital

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Einstein/Montefiore Medical Center

Bergen Nelson
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PHYSICAL MEDICINE/ REHABILITATION

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Kelly Scott
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Cristina Vieira
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Alisa Land
UCLA Neuropsychology Institute

Elizabeth LaRusso
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Jonathan Merson
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Gisela Sandoval
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University of California–San Francisco

Linda Chan
University of California–San Francisco

Ronald Chen
Brigham and Women's Hospital

Victoria Croog
Memorial Sloan-Kettering Cancer Center

Ruben Fragoso
Thomas Jefferson University, Philadelphia

Christopher Myers
University of Texas/MD Anderson Cancer Center, Houston

Paul Nguyen
Brigham and Women's Hospital

SAVE THE DATE

What's New at HMS:
The Fourth Annual Hollis L. Albright '31 Symposium

The Positive Potential of Stem Cells

George Q. Daley '91, PhD
Executive Committee, Harvard Stem Cell Institute

with Dean Jaseph B. Martin, MD, PhD
and Dean Daniel D. Federman '53, Maderatar

Wednesday, October 13, 2004, 4:00 to 6:00 p.m.
New Research Building, 77 Avenue Louis Pasteur

For more infarmation contact Tenley Albright '61 at tenley1003@aol.com or 617-247-8202

Andrew Wang
Brigham and Women's Hospital

RADIOLOGY

Lea Alhilali
University of Texas Southwestern Medical School, Dallas

David Boyajian
New York Presbyterian Hospital (Cornell)

Daniel Garza
Harbor-UCLA Medical Center

Antonio Gutierrez
UCLA Medical Center

Brook Hill
Jackson Memorial Hospital, Miami

Ravi Kamath
Massachusetts General Hospital

Jessica Leung
University of Washington Affiliated Hospitals, Seattle

Weichung Liu
UCLA Medical Center

Kalpana Mani
Beth Israel Deaconess Medical Center

Amin Matin
UCLA Medical Center

Javier Nazario Larrieu
Baylor College of Medicine, Houston

Michael Powell
Beth Israel Deaconess Medical Center

Ori Preis
Massachusetts General Hospital

Grace Tye
Stanford University Programs

Jeff Velez
Beth Israel Deaconess Medical Center

OTHER

Sandeep Datta
Postdoctoral Fellow, Center for Neurobiology and Behavior, Columbia University

Elissa Gaies
Non-clinical pursuit

Alvan Ikoku
Doctoral candidate in English and Comparative Literature, Columbia University

Alice Jacobs
Chairman and CEO, Intelligent-MD, Cambridge, MA

Wynn Kao
Postdoctoral research

Kenway Louie
Postdoctoral research

Alvin May
Non-clinical pursuit

Christopher McGuire
Eisenhower Army Medical Center, Fort Gordon, GA

Kelvin Neu
Associate, Baker Brothers Advisors, and co-founder, Southeast Asian Leadership Initiative, New York, NY

Kristina Steenson
Public health outreach, Siloam Family Health Center, Nashville



PRESIDENT'S REPORT

IN MARCH, THE ALUMNI COUNCIL met intensively for two days to discuss its mode of operating, strategies to enhance its effectiveness, and plans for its future. Although this brief description may suggest a strategic planning process, the meeting may be more aptly characterized as a prelude to a more ambitious endeavor to map the Council's activities for the next three to five years.

Given that the Council's last retreat was held in 1985, several meaty issues required attention before a "blue sky" discussion of mission, vision, and values could take place. The meeting offered an opportunity for Council members to join our opinions with those voiced in the recent HMS alumni survey to create an action-oriented blueprint that will shape the group's agenda for at least the next two years. Although space constraints preclude me from providing a full accounting of the ten hours of our discourse, I would like to share one topic that will dominate the Council's work for the next several meetings—student indebtedness.

Student indebtedness is not only a concern to HMS students but also to the entire community of medical educators and, by extension, the medical profession. Recently the American Association of Medical Colleges issued a report on the current state of student indebtedness. Some of the findings were startling. Since 1984, for example, increases in median tuition and fees have risen 50 percent for private medical schools and 133 percent for public medical schools, based on constant dollars.

The median amount for those who assume debt has increased from $22,000 for public schools and $27,000 for private schools in 1984 to $100,000 and $135,000 respectively, in 2003. Given the expenses, it is no surprise to learn that more than 60 percent of medical students emanate from families in the top quintile of family income. Even so, more than 80 percent of all medical graduates leave school with some debt.

So how is HMS faring with this issue? Although HMS debt levels are significantly lower than the national average, the mean medical school debt at graduation for the Class of 2003 was still a remarkable $71,719. In fact, 70 percent of the graduates of the class carried medical school debt, which does not take into account the other expenses a student may incur, such as credit card debt, automobile loans, and even home mortgages. The burden of debt may make a fourth-year student think twice before considering a career as a full-time researcher or a primary care physician.

What is HMS doing about this issue? The School, in collaboration with the President's Office of Harvard University, has initiated an alumni loan repayment demonstration program. Qualified participants working in lower-paying positions will receive grants to cover their loan repayments.

In addition, Daniel Federman '53, the senior dean for alumni relations and clinical teaching, and Robert Glaser '43B have been spearheading the Scholarship Campaign, which—thanks to the targeted giving of those classes celebrating their 25th, 40th, and 50th reunions and the generosity of many alumni—will soon reach its $35 million goal.

Council members are concerned, however, that this funding may not be enough, since tuition will increase yet another 7 percent this coming year and will likely continue to rise. For now, the Council wishes to emphasize the importance of this issue and to encourage alumni to contribute generously to the Scholarship Fund. For the next two years, this initiative will dominate the Council's agenda as we seek to develop additional strategies to make HMS accessible to all students, regardless of socioeconomic background.

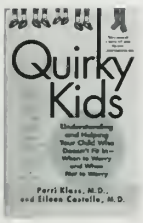


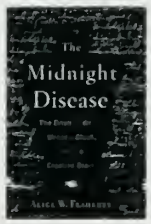
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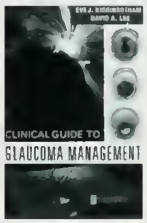
Student indebtedness affects us all as we consider the possibility of losing highly qualified candidates because of the expense of medical education. HMS cultivates the leaders of the next generation; no medical student should be left behind. Although the need-based scholarship budget for HMS was second only to Stanford's in 2002, we should seek to go beyond our competitor in this category. Harvard leads the list of medical schools with regard to research and education. Harvard should also lead the way in its ability to provide more scholarships.

This past winter Harvard President Lawrence Summers announced his plan to eliminate the requirement that parents contribute to Harvard undergraduate costs for families with an annual income below $40,000. Can we do the same for HMS students? ■

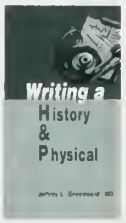
Eve J. Higginbotham '79 is chair of the Department of Ophthalmology at the University of Maryland School of Medicine.



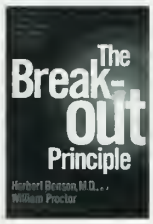












Quirky Kids

Understanding and Helping Your Child Who Doesn't Fit In, by Perri Klass '86 and Eileen Costello *(Ballantine Books, 2003)*

This book offers guidance on how to spot childhood "quirks" that might signal disorders. Practical advice aids parents in navigating school systems, intervention programs, specialists, medications, social situations, and familial issues. The authors, both pediatricians and mothers, mine their extensive experience and compassion to illuminate the challenges of raising unusual kids and to embrace the differences that set these children apart.

The Midnight Disease

The Drive to Write, Writer's Block, and the Creative Brain, by Alice Flaherty '94 *(Houghton Mifflin, 2004)*

The author, a neurologist, examines the roles the temporal lobes and limbic system play in the desire to write. Her investigations into hypergraphia, writer's block, and procrastination are enriched by personal, professional, and literary anecdotes that add humor, poignancy, and insight to the carefully explained neuroscience.

Clinical Guide to Glaucoma Management

by Eve J. Higginbotham '79 and David A. Lee *(Butterworth Heinemann, 2004)*

Fifty-four experts contributed to this volume on glaucoma, a disease affecting nearly 2.5 million Americans over the age of 40. The editors, both ophthalmologists, focus on the epidemiology of the disease, the evaluation of individual patients, pharmacological and surgical treatments, and the business of risk management. The 39 short chapters, which are illustrated with diagrams and color photographs, were created with the realities of clinicians' busy schedules in mind.

Them and Us

Cult Thinking and the Terrorist Threat, by Arthur J. Deikman '55 *(Bay Tree Publishing, 2003)*

Deikman's treatise offers insight into the mind of the terrorist as well as into normal inclinations to devalue outsiders with "good versus evil" dichotomies. The author, a psychiatrist, identifies four basic cult behaviors, illustrates how they operate, and offers suggestions to counter terrorism. He concludes powerfully: "There is no Them. There is only Us."

Writing a History & Physical

by Jeffrey L. Greenwald '94 *(Hanley & Belfus, 2003)*

This straightforward, articulate book takes the physician step by step through both the content and purpose of each aspect of a history and physical. Helpful examples demonstrate both best methods and pitfalls, with an emphasis on recording facts, not analyses or impressions. The book includes an abridged guide for at-a-glance reference. Practical even in size, Greenwald's book will fit in a lab coat pocket.

Ornithine Transcarbamylase

Basic Science and Clinical Considerations, by Philip J. Snodgrass '53 *(Kluwer Academic Publishers, 2004)*

This text represents the author's 40 years of research on ornithine transcarbamylase (OTC)—one of five enzymes in the urea cycle, the first metabolic cycle to be identified. Snodgrass, a gastroenterologist and hepatologist, begins with the first documented cases of OTC deficiency in 1962 and examines the current knowledge on the genetics, pathology, clinical findings, and treatment of the deficiency.

The Breakout Principle

How to Activate the Natural Trigger that Maximizes Creativity, Athletic Performance, Productivity, and Personal Well-Being, by Herbert Benson '61 and William Proctor *(Scribner, 2003)*

The authors provide practical techniques for personal transformation. They explain the physiological changes—particularly the role of stress hormones, nitric oxide output, and brain activity—that occur when people experience "breakout" moments or peak performances, and they offer advice on how to reach those moments regularly. The underlying principle, they write, is that letting go of problems helps solve those problems.

New Clues—and Hopes—in the Fight Against Cystic Fibrosis

THE SEARCH FOR SIGNS OF LIFE on Mars has focused on the ancient lakebeds and riverbeds that crisscross the Red Planet, and for good reason. Water is the medium of life. Cells are awash in it both inside and out. They also secrete fluids such as saliva, tears, sweat, mucus, and digestive juices through their many membrane channels. Usually these secretions are aqueous and slippery, but in people with cystic fibrosis, a genetic defect in one of the membrane channels upsets the water and chemical composition of the secretions, making them pathologically viscous and sticky.

It now appears that the cystic fibrosis mutant gene may cause disease by altering the balance of another set of primordial molecules, the fatty acids. The discovery, reported by Steven Freedman '73 and colleagues in the February 5 issue of the *New England Journal of Medicine*, could lead to a new understanding, and possible treatments, not just of cystic fibrosis, but also of a host of related diseases such as pancreatitis, chronic sinusitis, and male infertility.

Too Hot to Handle

For years, blame for the symptoms of cystic fibrosis was pinned on the viscous secretions, which clog up and produce life-threatening infections of the lungs. Over the past decade, more evidence suggests that the severity of these infections is the result of another culprit, an overenthusiastic inflammatory response.

"It is not the bacteria so much as it is the host's exuberant response to the bugs that are just stuck there in the tenacious secretions," says Freedman, HMS associate professor of medicine at Beth Israel Deaconess Medical Center. "Your body is just attacking them, almost out of control, and the lung tissue is being destroyed as a kind of innocent bystander."

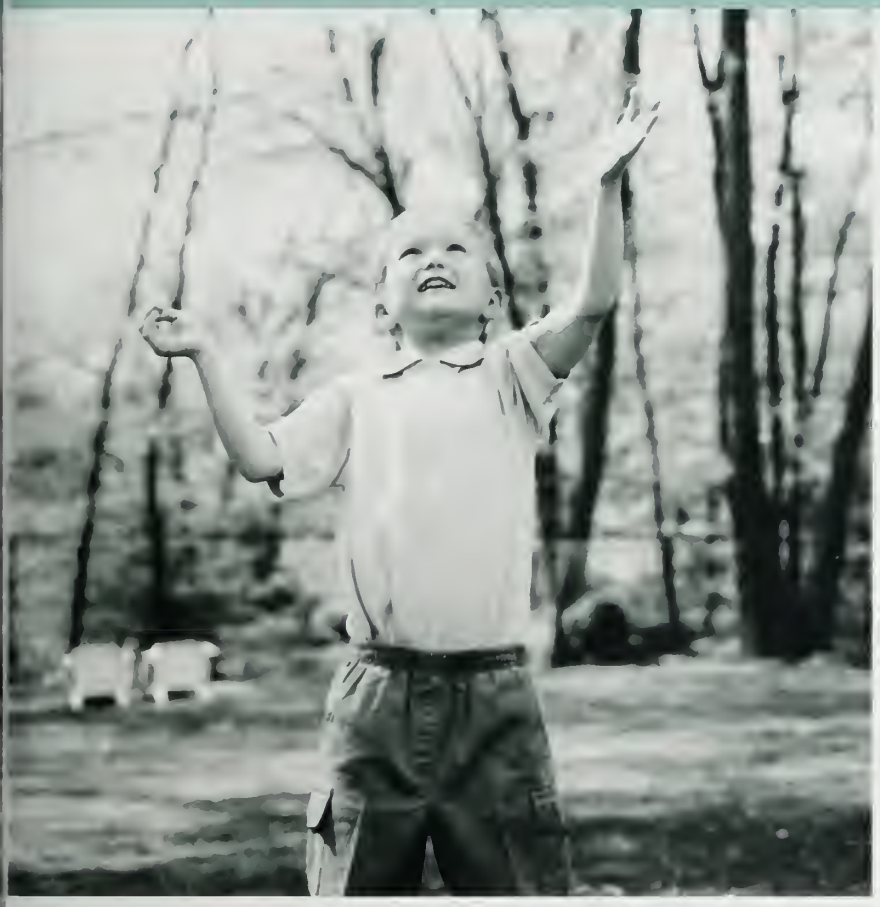
But it was unclear how a mutation in a single channel protein, the cystic fibrosis transmembrane conductance regulator (CFTR), could produce two such divergent responses—viscous secretions and an overly reactive immune system. In 1999, Freedman and his colleagues showed that transgenic mice carrying two copies of the mutant CFTR gene produced an abnormal ratio of fatty acids. These long-chain molecules serve as building blocks for the cell membrane, and some are also precursors to important inflammatory proteins. Compared to wild-type mice, the mutants exhibited an excess of the pro-inflammatory fatty acid—arachidonic acid—and too little of the anti-inflammatory substrate—docosahexaenoic acid (DHA). Intriguingly, transgenic mice carrying only one copy of the gene exhibited a ratio intermediate between the homozygotes and wild types.

In a compelling breakthrough, Freedman and his colleagues discovered they could correct the fatty-acid imbalance and reverse disease by giving the mice huge doses of DHA. Inspired by the findings, Freedman—along with Juan Alvarez, HMS associate professor of obstetrics, gynecology, and reproductive biology at Beth Israel Deaconess Medical Center; Michael Laposata, HMS professor of pathology at Massachusetts General Hospital;



THE SKY'S THE LIMIT: Researchers are hopeful that new discoveries about the role of a fatty-acid imbalance may lead to effective therapies for people like five-year-old Joey, who was diagnosed with cystic fibrosis as an infant.

The discovery could lead to possible treatments, not just of cystic fibrosis, but also of a host of related diseases, such as pancreatitis and male infertility.



and colleagues—analyzed samples of CFTR-expressing cells from the plasma and nasal and rectal passages of 38 patients with cystic fibrosis.

The researchers found that the patients produced twice as much arachidonic acid, which belongs to the omega-6 family of fatty acids, and one half as much DHA, a member of the omega-3 family, as those unaffected by the disease. People carrying only one copy of the mutant cystic fibrosis gene, who typically show no signs of disease, fell somewhere in the middle, suggesting that the mutant CFTR directly affects the fatty-acid ratio.

Significantly, the researchers did not find a similar dramatic fatty-acid imbalance in people suffering from other forms of inflammation such as inflammatory bowel disease, colitis, and certain forms of asthma. "So inflammation alone," says Freedman, "does not lead to the fatty-acid abnormalities to the degree we see in cystic fibrosis."

Therapeutic Approaches

It is not clear how a defect in an ion channel protein causes the fatty-acid imbalance. The channel pumps ions out of the cell, particularly chloride, yet CFTR is thought to participate in many other aspects of cell function. "That is what has made it, in part, so problematic to come up with a treatment for cystic fibrosis," says Freedman. The researchers have not yet tried to correct the fatty-acid imbalance in patients as they did in mice.

"One problem is that the dose of DHA we gave the mice is very high," Freeman adds. "If we extrapolate to humans, it would be six to seven grams of pure DHA. That is 30 or more over-the-counter capsules, and those are not that pure."

In cystic fibrosis, the combination of viscous secretions and overexuberant inflammatory response wreaks havoc on the enzyme-producing pancreas and bile-producing liver. The approximately 30,000 Americans affected by the disease have a hard enough time digesting even modest amounts of nutrients and must often take massive doses of enzymes. "They could never absorb that amount of DHA no matter how many pancreatic enzyme pills you gave them," says Freedman. He is talking with pharmaceutical companies about the possibility of developing a more concentrated and absorbable form.

Cystic fibrosis patients and their families would gain most from such a formulation. Although the average life span of people with cystic fibrosis has doubled in the past few decades thanks to a combination of diet and physical therapy, it still is only 31 years—less than half the national average.

Other patients might benefit as well. Freedman and his colleagues have found that 50 percent of people with pancreatitis carry mutant versions of the CFTR protein. The mutant gene has also been found in 40 percent of people with chronic sinusitis and 30 percent with unexplained male infertility.

Freedman, however, cautions all patients about rushing to self-medicate with over-the-counter omega-3 formulations. "I would be especially careful about supplementing in the cystic fibrosis population," he says. "It is obviously a devastating disease. But we need to learn more about the role of DHA here. In particular, could there be side effects of high doses?" ■

Misia Landau is the senior science writer for Focus.



WATER UNDER

by GORDON WORLEY

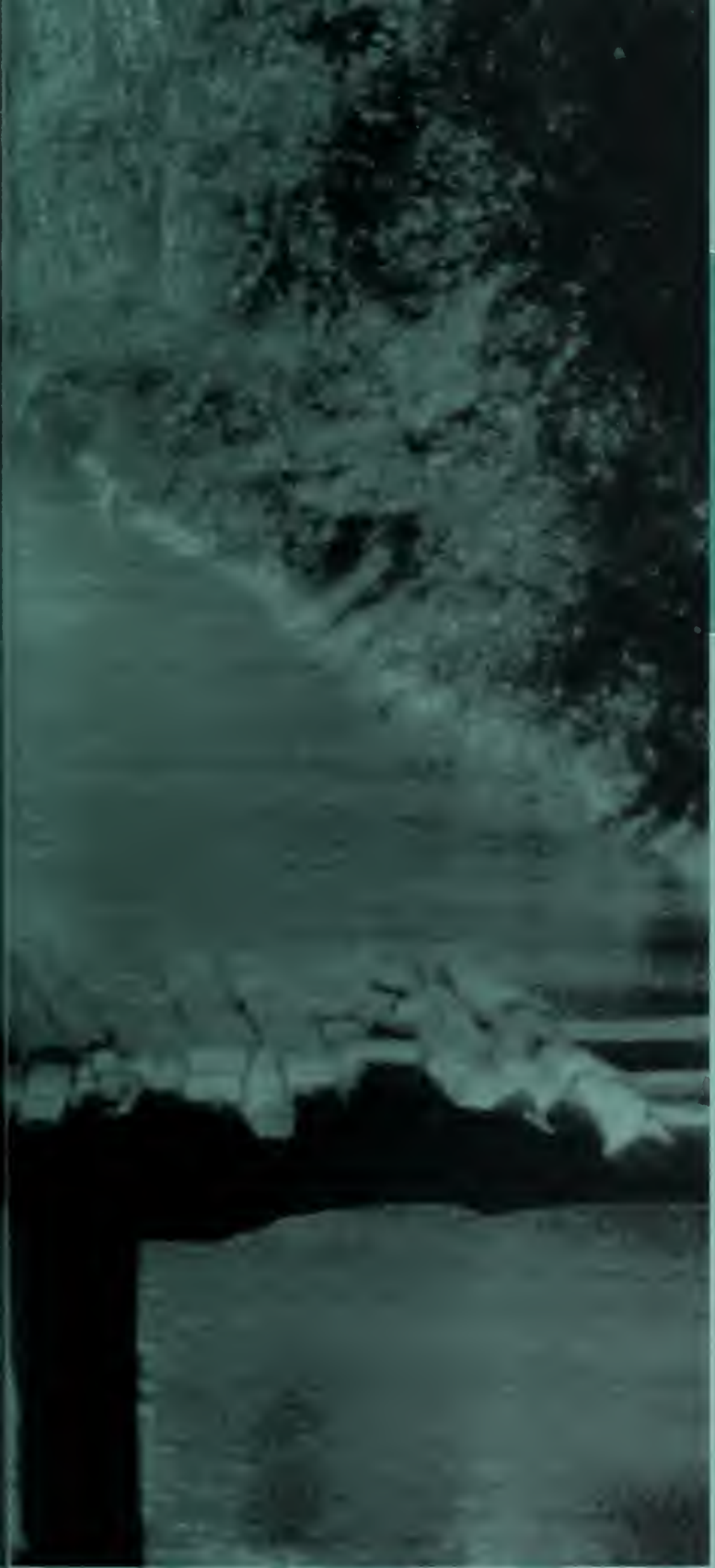


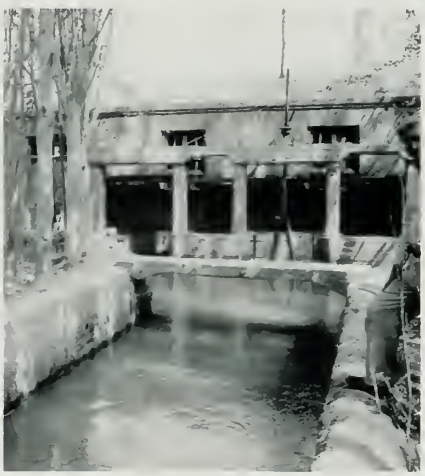
PHOTO: SHANNON HAGER

THE BRIDGE

A neurologist turns to hydrology, agronomy, and veterinary medicine to tackle the world's most preventable cause of mental retardation

AS A YOUNG BOY GROWING UP IN INDIANA, G. Robert DeLong '61 would toss sticks into creeks to gauge the speed of the water. Little could he have known how useful his childhood game would prove decades later, when he set out to eradicate a disease that for centuries had been devastating children in a remote corner of China. ■ DeLong traces his fascination with iodine deficiency disorders (IDD) to nearly 25 years ago, when his mentor, John Stanbury '39, suggested that he join a medical trip to Ecuador. "I thought the reports would turn out to be exaggerated," DeLong recalls. "But in a single month in an Andean mountain village I saw 120 cases of a disease that, until then, I'd only read about in textbooks. These were people in whom prenatal iodine deficiency—and the resulting fetal hypothyroidism—had caused cretinism, characterized by blighted physical and mental development, spastic-rigidity, and deaf-mutism. The disease just debilitated the entire community." ■ DeLong remembers in particular one young woman whose limbs were so twisted that she had to use her elbows to drag her body across the floor of her family hut, with all the painful laboriousness





ONE-THIRD



SOMETHING IN THE WATER: Clockwise from bottom left: an irrigation canal in Xinjiang where a potassium iodate dripping helped replenish the health of several villages; a Uighur mother and child; Nancy and Robert DeLong comforting a young patient

of a beached mermaid. Her family members would often prop her up outside, then carry her in when it began to rain.

When this same young woman became pregnant, she might have given birth to a baby as impaired by iodine deficiency as she had been. But as part of the local IDD control project, she received an intramuscular injection of iodine-in-oil during the second trimester of her pregnancy. The daughter she delivered is now a college graduate who speaks three languages.

In the decades since his first encounters with IDD, DeLong, a professor of pediatric neurology at Duke University, has witnessed many other instances of the transformative power of even tiny doses of iodine in preventing the disorder. So when he encountered unusually high rates of the disease in Xinjiang, a province in northwestern China, he became determined to find a solution.

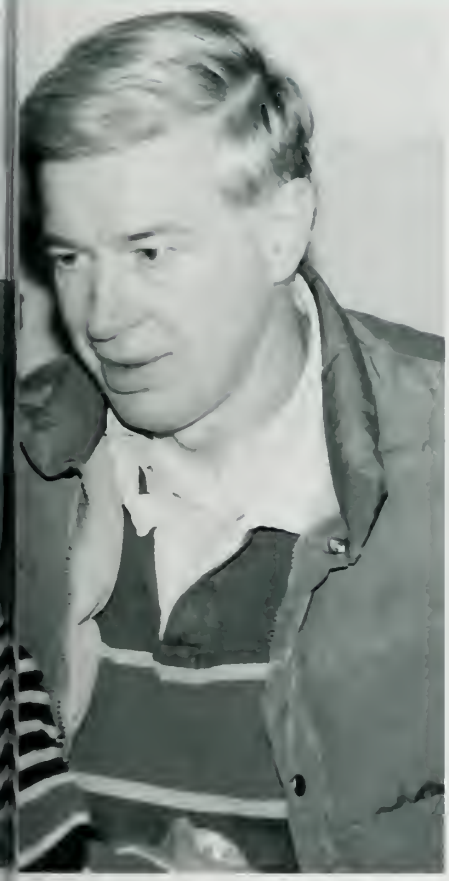
The Salt of the Earth

Symptoms of iodine deficiency have plagued humankind for millennia. A second-century frieze of Buddha and his disciples, for example, shows a figure with goiter. Drawings from the thirteenth century depict people with goiter and cretinism, and Renaissance painters from Dürer to Rubens captured on canvas many subjects with goitrous necks.

Today, iodine deficiency still condemns many thousands of children to cretinism, tens of millions to varying degrees of mental retardation, and hundreds of millions to milder degrees of mental and physical impairments. An estimated 1.6 billion people are at risk for IDD, now recognized as the most common preventable cause of mental retardation worldwide.

Nearly one-third of the globe's inhabitants live in areas of natural iodine deficiency. The regions most affected are mountainous ones, where glaciation, snow, and rainfall leach the mineral from the soil; flood plains such as that of the Ganges; and inland continental expanses far from the world's oceans, which are the primary sources of iodine.

OF THE WORLD'S INHABITANTS LIVE IN AREAS OF NATURAL IODINE DEFICIENCY.



Countries around the world have responded to the problem, adding iodine to tea in Tibet, bread in Australia, and fish paste in Thailand. Yet fortifying ordinary table salt with iodine, the most common method, is also considered the best. IDD was endemic in the Appalachian, Great Lakes, and mountainous western regions of the United States, for example, until the 1920s, when iodized salt consumption became widespread.

Iodized salt does not offer a solution for people living in many remote areas of the world, though. Some communities find it too expensive or difficult to obtain; others reject it as less flavorful than locally available salt. Efforts to provide oral or injected iodine-in-oil to people living in areas with endemic IDD often fail because of issues of cost, distribution, or sustainability. Cultural traditions and superstitions may create obstacles as well.

Testing the Waters

The problem of iodine deficiency is hardly new to Xinjiang: while traveling through the region during the thirteenth century, Marco Polo recorded observations of people with diminished intelligence, deafness, spasticity, and enlarged throats. Throughout the intervening centuries, the tragic consequences of iodine deficiency have continued to plague Xinjiang, whose water and soil contain some of the planet's lowest levels of naturally occurring iodine.

A constellation of factors had contributed to the failure of efforts to provide the people of Xinjiang with iodine. Some of the barriers were cultural. Forty percent of the region's inhabitants are Uighurs, a Turkic people who comprise the largest of China's minority groups. The Uighurs—most of whom live in villages dotting the perimeter of the Taklimakan Desert—find iodized salt not only less affordable, but also less savory than the rock salt so abundant in the desert.

"The Uighurs have a tradition of picking rock salt off the desert floor, dissolving it in big clay pots, and then using the brine for cooking," DeLong says. "The desert salt has a 'brighter' flavor—likely from its magnesium content—but unfortunately it contains little iodine."

Exacerbating the problem was the centuries-long contentious relationship between the Uighurs and the majority Han, who dominate the country's central government. And so the Chinese authorities' attempt to offer iodine pills failed, among other reasons, because the Uighur women suspected officials of trying to slip them contraceptives.

Efforts to introduce iodine intramuscularly had fallen short as well. Injections such as those used in Ecuador required medical expertise and supplies not widely available in Xinjiang. And local public health authorities were skittish about injections for another reason: in 1988, the area had suffered a hepatitis epidemic that had left 500 dead, and they wanted to avoid the risks of shared needles.

When DeLong first visited Xinjiang in 1989, he found one in ten children suffering from severe IDD and one in three exhibiting symptoms of iodine deficiency. "We were examining literally hundreds of children," he says. "Some showed extreme mental retardation and could not walk, stand, or even sit. Even the ones without severe signs were slack and dull eyed. They simply lacked the natural vivacity of children."

During repeated trips to Xinjiang, as DeLong pursued his initial goal of studying the impact of iodine deficiency on fetal brain development, he pondered ways to prevent the calamity from occurring in the first place. By then he had grown close to two Chinese colleagues, Ma Tai, a leading expert on IDD in China, and Cao Xue-yi, the head of Xinjiang's Health and Anti-Epidemic Station. Together they explored—and rejected as impractical—possible solutions to the seemingly intractable problem.

Then, one day after working in the clinic, the collaborators happened to drive to the countryside to see the main irrigation dam, 20 miles upstream. "We looked out over the Hotien River with its complex system of irrigation canals, the basis of all human life there," DeLong says. "It was fascinating, but I didn't give it much thought. Back in the capital the next day, I chatted with a local water chemist about the concentrations of various minerals, such as iron and copper, in the water. But the penny still didn't drop."

That evening, DeLong says, "We were driving to a Uighur comedic performance when suddenly it hit me. I practically shouted, 'We can drip potassium iodate into the irrigation water!' Dr. Ma threw up his hands and cried, 'We'll all go to jail!' But by the next day, he was

"SUDDENLY IT HIT ME. I PRACTICALLY

thinking about it seriously. It quickly became clear that the idea could work."

DeLong had realized that iodinating the irrigation water could protect entire villages. The plants would absorb the iodine that had leached from the treated water into the soil. The animals, in turn, would ingest the iodine-rich plants. At the top of the food chain, people would finally consume sufficient levels of iodine.

Obtaining approval for his proposal from suspicious local communities would be tricky, DeLong knew. But an incident that had taken place the previous year had helped convince the wider Uighur community of the physician's good intentions.

Late one afternoon DeLong, Ma, and their team were working in a small clinic in the village of Tusala when a sandstorm swept in from the desert. DeLong's wife, Nancy, who has shared his IDD work at every stage, recalls that day.

"About three o'clock the room suddenly became almost as dark as night, with an eerie yellow light," she says. "A gale force wind was blowing the trees sideways and sending dust swirls skyward. The patients covered their mouths and noses with their headscarves and huddled along an inside corridor. The lights flickered and went out."

Just as the medical team had begun examining patients again, a great commotion of people burst into the room; they were bringing in a young boy who had picked up a live cable blown down by the storm. For several long minutes DeLong desperately tried mouth-to-mouth resuscitation and chest compressions but could get no response. Then someone mentioned that the boy's father had transported him to the clinic in a donkey cart for six kilometers.

"I shined a light into the boy's eyes," Nancy DeLong says. "He was dead. Bob straightened up, told the father he was sorry, and stood helplessly in tears, as the father, fighting for control, gently lifted his child, wrapped a sheet—now a shroud—around him, and carried him from the room, clasped tightly to his breast."

"Tragically, our sustained efforts couldn't revive the boy," Ma later recounted. "Yet his family bent down to express their heartfelt gratefulness. And the story about the American doctor spread, even to the capital."

The reservoir of good will that DeLong generated that day may have helped his cause when, a year later, he and his team explained the proposal to iodinate the irrigation water to villagers in the chosen site of Long Ru township. Each phrase was painstakingly translated into Mandarin, then into Uighur. To the team members' relief, they found a receptive audience. The villagers discussed the dilemma, then took a vote.

"When we met with the village leaders in Long Ru, the temperature was hovering near zero," remembers Nancy DeLong. "They were all sitting around in their thin coats and wool hats. Their breaths sent tiny clouds into the air and their wonderful weathered faces looked like stone. Then suddenly everyone erupted: 'Yes, we approve!'"





MINERAL RIGHTS: Parents with cretinism gave birth to a healthy daughter, thanks to the introduction of iodized salt in southcentral China several years earlier (top); a Uighur father cradling his child in Xinjiang (above); a sheep herder in the dusty Taklimakan Desert (right)

All Hands to the Pump

In 1854, anesthesialogist Jahn Snaw salved the mystery of a fost-moving, deodly cholero epidemic in Londan, one he later termed "the mast terrible autbreak af cholero which ever occurred in the kingdam." On the night af August 31, residents scattered across a Soho neighborhood fell vialently ill. Within three doys, 127 people hod died. A week loter, the toll had risen to 500.

Fram the stort Snow interviewed the fomilies of victims, reviewed deoth records, and wolked the neighborhood, seeking patterns. His suspicions soon centered on the Broad Street water pump. The clues quickly accumuloted: many of the victims lived near the pump, and the closer peaple lived ta anather pump, the less likely they were ta have contracted chalero. None af the workers in o nearby brewery, where the men drank free beer rather than woter, grew ill. And only

SHOUTED, 'WE CAN DRIP POTASSIUM IODATE INTO THE IRRIGATION WATER!' "



The Bottom of the Barrel

One of the first tasks facing DeLong's team was calculating the flow rate of the canal. Impatient for the arrival of outside help, DeLong drew on his youthful penchants. In the eighth grade he had taken an interest inventory test that recommended he become a county agricultural agent. So it was with a sense of familiarity that he tackled the challenge.

"We stripped to our undershorts, waded into the canal to measure its cross-section, then threw sticks in the water and recorded how fast they floated by," DeLong says. "I felt like I was back on my uncle's farm in Indiana, tossing twigs into the creek. Much later, we learned that our estimate was within 10 percent of the official measurement."

The team next devised a primitive delivery system: a 55-gallon oil drum coated with epoxy paint to prevent oxidation and rigged with a spigot that could be turned on and off. The spigot was not precise enough in regulating the output, though, so they used intravenous tubing and two clamps to cobble together a simple valve to provide a steady flow. They tested their contrap-

o handful of the 530 inmotes of o locol workhouse—which hod its own pump—become sick. One clue confounded Snow, though: the deoth of o widow who hod not visited the neighborhood for yeors. Then on interview with her son reveoled thot the woman hod indulged o doily hobit af dispotching o servont to the Brood Street pump, for she preferred the toste of its woter. Snow convinced the locol porish to remove the handle from the pump, ond the epidemic subsided.

Jahn Snaw would recognize in Robert DeLong o kindred spirit. In the one instonce o physician praved thot woter wos a lethol threot; in the other, woter become o life-sustoining force. By solving seemingly introctoble problems with ingenuity ond perseverance, DeLong become, in the troditian of John Snow, an excellent exomple of whot on individuol doctor con occomplish for the public good. ■

IODINATING SALT LICKS HAD

tion overnight in a hotel parking lot—and found that it worked.

Next they perched the oil drum on a wooden bridge spanning the irrigation canal. For two weeks during the spring of 1992, the team dripped a 5 percent solution of potassium iodate into the canal, which supplied four villages in Long Ru township with water. They hired a local villager to protect the drum from theft, refill the tank, and monitor the flow rate. At night, the man would unfurl his rolled-up blanket and sleep right on the rough-hewn bridge.

Soon more men were needed to safeguard more barrels. Decisions about the placement of the drums and the timing of the dripping were made with the input of local officials, particularly the *kuai-ji*, or water accountants, who oversaw all aspects of irrigation for the region. During the spring planting, as many as 20 tankfuls of potassium iodate solution were dripped into a canal from a single site.



The Taste of Success

Measurements from samples sent to a laboratory in Ürümqi, the capital, revealed that iodine concentration in treated areas had increased four-fold in the soil within weeks and three-fold in the crops and animals within months. Within one year, nearly all local women of childbearing age had iodine levels well out of the danger zone. The results were most dramatic in children conceived after the program began. Within three years of the first dripping, the infant mortality rate fell by half. Later assessments showed that the average height of five-year-olds had increased by four inches. And the intelligence quotients of children born after the dripping averaged 16 points higher than those of children born before the dripping.

"When we first arrived in Xinjiang, I thought the children were withdrawn because they were afraid of us," says Nancy DeLong. "But as time passed, and the treated water took effect, I realized that the children were growing livelier."

Local livestock thrived too. Within a year, sheep production had increased by 40 percent. And as a result, the average annual family income rose 5 percent.

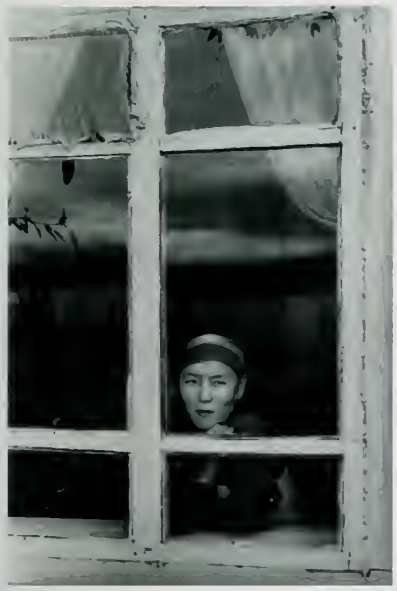
From their initial study, published in 1994, DeLong and his colleagues concluded that treating irrigation water was an effective and relatively inexpensive method of supplying iodine to people in irrigated areas where IDD is endemic. With the support of the Thrasher Foundation, the Joseph P. Kennedy, Jr. Foundation, Kiwanis International, and UNICEF, the team undertook a major expansion of its program in 1997. Iodine dripping now protects 2.6 million people from IDD in the 16 most severely deficient areas of Xinjiang. Thirteen and one-half tons of potassium iodate have already been dripped, at a cost of less than six cents per person.



A Giant Leap for Mankind

Robert DeLong's interest in IDD stemmed from his experience as a pediatric neurologist at Massachusetts General Hospital, where he met John Stanbury '39, then chief of the hospital's thyroid service and a professor of nutrition at MIT. Stanbury, already renowned for his pioneering studies of inherited metabolic disease of the thyroid, had widened his interests to encompass the international problem of IDD.

BEEN SUCCESSFUL IN THE NETHERLANDS AND ENGLAND.



SCENES FROM SIBERIA: Nomadic horsemen rest near a lake in Tuva (left); a girl peers out of a window of the Tos Deer Shaman Association in Tuva

Iodine concentrations in soil, crops, meat, and human urine, monitored since the one-time dripping, indicate that a single dripping can provide iodine for at least six years. Iodination of irrigation water has now been undertaken in Inner Mongolia and is planned for Kyrgyzstan.

The Saline Solution

But what about iodine-deficient areas of the world where widespread irrigation doesn't exist? In the heart of Siberia, at the geographic center of Asia, lies Tuva, the poorest republic in Russia. Home to a Mongolian people, Tuva is renowned for its rich folklore, skilled artisans, and *khoomei*, a form of throat singing whose haunting notes are said to mimic the wind sweeping across the steppes. The area is also known for its elevated rates of IDD.

There infant mortality runs high, and in some areas nearly half of the newborns have hypothyroidism caused by iodine deficiency. The lasting economic disruption that followed the collapse of the Soviet Union has made iodized salt an impractical solution. And, unlike the people of Xinjiang, the Tuvans do not rely on irrigation water. They depend instead on animal herding for their livelihood, raising sheep, cattle, horses, goats, and even camels on the elevated steppes of their ancestral homeland.

When DeLong reflected on the high rates of severe IDD in Tuva, he reasoned that the most efficient way to distribute iodine would be by adding potassium iodate to salt licks for the animals on whose products—mutton, beef, milk, cheese, and yogurt—the people relied. "We knew," he says, "that iodinating salt licks had been successful in the Netherlands and England, where the iodine levels in cows rose dramatically."

The plan required machinery for crushing rock salt, adding iodate, and making salt blocks. The Tuvan government approved the plan and promised to supply the potassium iodate and workers to operate the plant. Local authorities agreed to distribute free iodinated salt blocks to all herders in the region.

But the machinery still needed to be financed, manufactured in India, and transported by ship, the Trans-Siberian railway, and truck to Tuva. And all this had to be arranged from half a world away. DeLong secured financial support from friends and members of Kiwanis International. By the fall of 2002 the machinery had arrived. So DeLong returned to Tuva with his Kiwanian friends.

"One of them was a high school mechanical shop teacher," DeLong says, "and he had that machine up and running in two days." By the time the Kiwanians staged a repeat visit the following spring, local workers were turning out iodinated salt blocks and distributing them to Tuva's mountain communities.

"Their sheep had been producing poor quality wool because of the lack of iodine," DeLong says. "If we're lucky, the salt licks should improve not only human health, but also the health of the local wool industry."

DeLong and his team hope that, as knowledge of the health benefits, affordability, safety, and economic advantages of iodinating irrigation water and salt licks spreads to affected areas of the world, so will the adoption of their practical methods. "With all the medical technologies we have to work with today," DeLong says, "it's easy to forget the incredible difference an ancient trace mineral can make to a single life, to a community—even to the world." ■

Gordon Worley '73 is an associate clinical professor at the Duke University School of Medicine.

At a time when IDD received little attentian in the United States, Stanbury recagnized that it remained a severe prablem in many parts af the warld and that its crux was nat gaiter, but rather curtailment af brain grawth, resulting in mental retardatian and, at the extreme, endemic cretinism. He alsa recagnized that IDD increased rates af miscarriage and infant martality. His leadership led ta his being named chairman af the Internatianal Cauncil far the Cantral af Iadine Deficiency Disarders at its inceptian in 1986 and ta his receiving the prestigiaus Prince Mahidal Award seven years later.

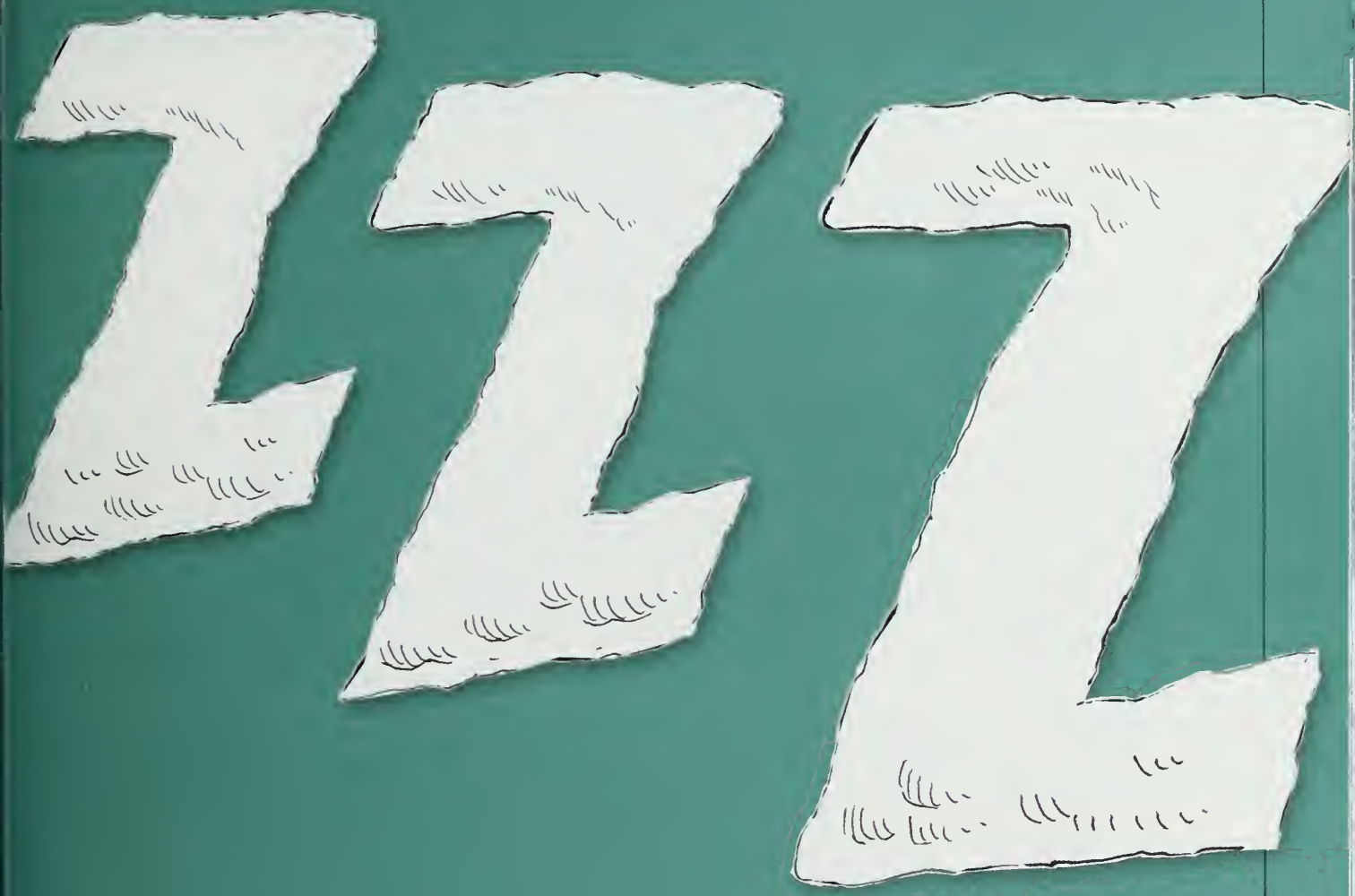
"Jahn had the imaginatian ta recagnize that IDD, which was considered anachranistic in the United States, was still a massive burden ta peaple in many parts af the warld," DeLang says. "And he has led and inspired many athers ta wark far the eliminatian af this critical prablem. He's a giant in the field." ■

The sharp clinical eye of Charles Dickens inspired a physicianly borrowing—and sparked



ILLUSTRATIONS: WESLEY BEDROSIAN

the imaginations of researchers dedicated to unraveling the mysteries of sleep disorders



PICKWICK REVISITED

BY THE TIME THE FRIGHTENED PATIENT WAS ADMITTED INTO THE Peter Bent Brigham Hospital, he was packing 263 pounds onto his five-foot-five-inch frame. For as long as he could remember, the man explained, he had been overweight, but now he had an alarming new set of problems to go along with his obesity.

by PETER V. TISHLER

"The object that presented itself to the eyes of the astonished clerk

Overeating in response to a series of "anxieties and frustrations" had caused the man to gain nearly 70 pounds in less than a year, his physician, C. Sidney Burwell '19, noted in a 1955 case report. As the patient's girth increased, so had his symptoms of fatigue, shortness of breath, and swollen ankles. But the man's acknowledgement of the high stakes of his condition—and the event that propelled him to the hospital examining room—took place during a poker game.

In the year preceding his hospital admission, Burwell's report observed, the man had occasionally fallen asleep—sometimes literally on his feet—while carrying on with his daily routine to the point that "he sometimes found it difficult to distinguish between reality and dreams." The final straw came when the patient dozed off during his weekly poker game, waking too late to take advantage of the extraordinary hand he had been dealt—three aces and two kings. And yet the patient's squandered full house may have saved his life.

What the Dickens

Burwell, who served as dean of HMS from 1935 to 1949, may have been the first clinician to recognize the relationship between the poker player's obesity and his hypersomnolence. As a researcher for many years and later as the first Samuel A. Levine Professor of Medicine at HMS, Burwell maintained laboratories at the Peter Bent Brigham Hospital and the Boston Lying-In Hospital. He was involved in obesity research at both institutions.

In addition to his research and teaching activities, Burwell maintained a clinical practice that focused, in part, on annual physicals of business executives. The obese 51-year-old patient whose case would ultimately inspire Burwell to write an article on what he labeled the "Pickwickian syndrome"—or morbid obesity associated with falling asleep at inappropriate times—was such an executive.

In writing up the case, Burwell and his colleagues drew a parallel between the patient and a fictional character, Joe the Fat Boy from Charles Dickens's 1837 novel, originally serialized as *The Posthumous Papers of the Pickwick Club*. In his article Burwell set the stage for naming the syndrome by invoking Joe:

A most violent and startling knocking was heard at the door... a constant and uninterrupted succession of the loudest single raps...

The object that presented itself to the eyes of the astonished clerk was a boy—a wonderfully fat boy—habited as a serving lad, standing upright on the mat, with his eyes closed as if in sleep...

"What's the matter?" inquired the clerk.

The extraordinary boy replied not a word; but he nodded once, and seemed, to the clerk's imagination, to snore feebly.

"Where do you come from?" inquired the clerk.

The boy made no sign. He breathed heavily, but in all other respects was motionless.

The clerk repeated the question thrice, and receiving no answer, prepared to shut the door; when the boy suddenly opened his eyes, winked several times, sneezed once, and raised his hand as if to repeat the knocking. Finding the door open, he stared about him with astonishment, and at length fixed his eyes on Mr. Lowten's face.

"What the devil do you knock in that way for?" inquired the clerk, angrily.

"Which way?" said the boy, in a slow and sleepy voice.

"Why, like forty hackney-coachmen," replied the clerk.

"Because master said, I wasn't to leave off knocking till they opened the door, for fear I should go to sleep," said the boy.

Burwell's connection between hypersomnolence and the Dickens novel displeased an editorialist in the *New England Journal of Medicine*, who countered that the syndrome should be called Fat Joe's Folly.

Naming Rights

The notion that Burwell and his colleagues were the first to recognize and describe the Pickwickian syndrome and to link it with Dickens's character is only one of several erroneous ideas surrounding the syndrome. The first clinical description may actually have been written almost two centuries before Burwell brought it to wide attention. In the same year in which the American colonies declared their independence from Britain, the physician John Fothergill reported on two obese patients from his London practice, both of whom exhibited classic symptoms of the syndrome. In one patient, Fothergill wrote, the manifestations of the disease eventually remitted with weight loss.

From the early 1800s up through the 1950s other physicians recorded cases similar to Fothergill's. The common denominators in their descriptions were obesity and hypersomnolence. But some of them also noted features such as cyanosis, polycythemia, and right heart failure. And, just as the syndrome itself was not new to the medical literature,

was a boy—a wonderfully fat boy—habited as a serving lad."



Burwell's invocation of Dickens in his naming of it also had precedent in the past. In fact, the syndrome had first been likened to the phenotype of Joe in *The Pickwick Papers* as early as 1889, by Christopher Heath, then president of the Clinical Society of London.

A little over a decade after Heath made his Dickensian connection, Sir William Osler, writing in the fourth edition, published in 1901, of his classic text, *The Principles and Practice of Medicine*, noted that "an extraordinary phenomenon seen occasionally in excessively fat young persons is an uncontrollable tendency to sleep." In the sixth edition, published in 1905, he added the phrase "like the fat boy in *Pickwick*." Osler was aware of the prior case descriptions of the phenomenon and probably also knew that Heath had already invoked the likeness of Joe in *The Pickwick Papers*. Similarly, Byrom Bramwell, a British physician, described, in 1910, a boy who "presents in a minor degree a condition similar to the Fat Boy in *Pickwick*."

Singular Sensation

On November 14, 1955, Burwell presented a paper before the New England Cardiovascular Society entitled "A

"An extraordinary phenomenon seen occasionally in excessively

Pickwickian Syndrome," in which he described his poker-playing patient. Two weeks later, he spoke at an American Medical Association meeting held in Boston. The presentation, entitled "The Care of the Patient," sought to reconcile the practice of contemporary medicine with the ideals Francis Peabody '07 expressed in his famous essay of the same title. Burwell used the description of his patient to focus on the "general objectives of medicine...to use the science of medicine; to use the art of medicine; and to exploit the inborn and ready-made skill of the experienced human organism."

One year later Burwell published, as lead author, the complete case report on his patient with the Pickwickian syndrome in the *American Journal of Medicine*. The "careful study of one patient," Burwell's article explained, would provide a basis to "consider the association of obesity, somnolence, polycythemia, and excessive appetite." The paper included quotes from Dickens's *The Pickwick Papers* and a reproduction of Thomas Nast's drawing of Joe, from an 1873 American edition of the novel.

Whether Burwell possessed any knowledge that others before him had applied this analogy is uncertain because neither Robert Whaley nor Eugene Bickelmann, two of his coauthors, ever heard him discuss his patient in relation to Dickens's character. His coauthors do remember, however, that he was fond of the classics. Whaley also recalls that physicians often described Burwell's publication and the naming of the syndrome as "cute."

But the whimsy of the name did not detract from the seriousness of the condition it described. In their paper, Burwell and his coauthors outlined the clinical features of the Pickwickian syndrome. These included marked

No Ordinary Joe

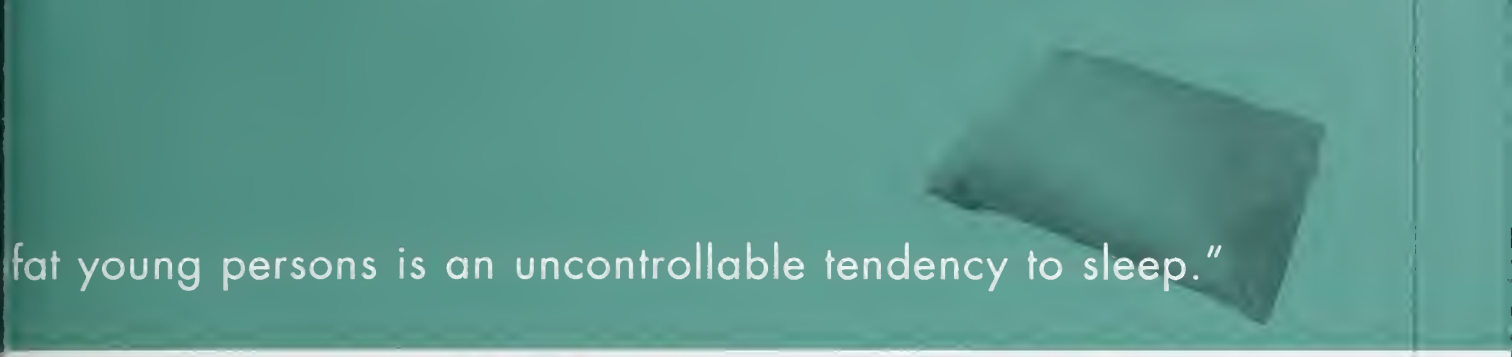


PHOTO: COURTESY OF THE HARVARD MEDICAL LIBRARY IN THE FRANCIS A. COUNTWAY LIBRARY OF MEDICINE

Physicians had been noting a connection between obesity and unusual sleepiness as far back as the days of the American Revolution. So why did the report by Burwell and his colleagues, written almost two centuries later, generate so much attention, both nationally and internationally?

Peretz Lavie, a sleep physiologist in Israel, has pointed out that the Pickwickian syndrome, as well as other sleep disorders, suffered from a widespread perception in the nineteenth and early twentieth centuries that excessive somnolence was inconsequential. Another prevalent—and erroneous—

THE BIG SLEEP: C. Sidney Burwell helped highlight the connection between somnolence and obesity.



obesity; somnolence; cyanosis; twitching (probably the myoclonic jerks/asterixis seen in association with hypercarbia); periodic respiration ("periods of apnea alternated with periods of tachypnea"); secondary polycythemia; right ventricular hypertrophy; and right ventricular failure (neck vein distention, hepatomegaly, and peripheral edema). The authors did not investigate the patient's breathing during sleep.

Fortunately, Burwell and his colleagues reported, with weight reduction the patient's "somnolence, twitching, periodic respiration, dyspnea, and edema gradually subsided and his physical condition became essentially normal." They postulated that the patient's obesity had led to shallow respiration, possibly resulting from the increased strain of breathing. Continued shallow respirations, they speculated, had ultimately led to alveolar hypoventilation, with resultant hypoxia, hypercarbia, and other clinical manifestations.

On the Right Track

In the late 1950s clinicians identified many patients with the Pickwickian syndrome. In 1959, when Burwell was the discussant at a Cabot Conference at Massachusetts General Hospital, he mentioned that he had studied a dozen patients with the syndrome. Medical students and faculty who were at the Brigham at the time report that they were familiar with the syndrome, as were those working at Boston City Hospital with the Harvard Medical Services in the mid-1960s.

Early in the next decade, a number of pulmonary physiologists developed polygraphic methods to study

notion wos thot such coses represented o form of norcolepsy. Both ideos moy hove discouroged further interest in the syndrome.

But o lorger onswer moy lie in the times. In the 1950s, mony developed notions were enjoying renewed prosperity ofter the tribulotions of the Greot Depression ond World Wor II. Food wos now plentiful ond offordoble. Industriol mechonizotion hod continued opoce, with the result thot lorge segments of the populotion engoged in less physicol octivity. These chonges combined to produce the beginning of the obesity epidemic so cleorly evident in todoy's society.

These trends olso coincided with the beginnings of mojor, ropid odvonces in medicol science; o burgeoning reseorch effort oided by the infusion of Notionol Institutes of Heolth funding; ond renewed postwor troining of physicions ond scientists. The criticol role of communicotion in the medicol sciences, represented by the circulotion of journols of relioble quolity, wos oscendont. Thus, on orticle in the *Americon Journol of Medicine*, o highly respected publicotion with o worldwide circulotion, would ottroct notice. Burwell's poper oppeored ot the right time ond in the right ploce.

It did not hurt Burwell's couse, either, thot tongue-in-cheek editoriols toking issue with the noming of the syndrome or some ospect of the description were printed in other visible publicotions. Further publicity orose from the loy press. In 1958, the medio reported widely on the triol of o colorful gombling kingpin by the nome of "Sloppy Joe" Bellinger. Sloppy Joe wos infomous for running numbers, whiskey, ond women in Sovonnoh, Georgio—and for weighing in ot 425 pounds. Yet his doy in court wos repeotedly deloyed becouse the defendont kept folling osleep eoch time he wos osked o compromising question.

Sloppy Joe's ottorney, Rolph Crowford, succeeded brilliontly in preserving his notorious client's freedom by invoking Sloppy Joe's uncontrolloble urges to snooze os o hopeless impediment to preporing o defense. Crowford's orgument wos buttressed by Bellinger's court-oppointed physicion, who concluded thot Bellinger could not be foirly tried until he shed ot leost 200 pounds. "The Pickwickion syndrome!" Crowford would cry out, before odmonishing the judge ond frustroted prosecutors. "Reod your Dickens!" ■



So hefty was Taft, who stood just under six feet

breathing that presaged the modern laboratory polysomnogram. These reproducible and quantitative methods were an essential step that led to the observations that apneas are important, that they occur independently of any change in alveolar or arterial carbon dioxide content, and that the arterial partial pressure of carbon dioxide is normal in most people whose sleep is disturbed by abnormalities of breathing.

In 1973, Christian Guilleminault, Frederic Eldridge, and William Dement at Stanford used this technology to describe a new syndrome, which they named sleep apnea. We now understand that Pickwickian syndrome is but one of the many manifestations of this more generalized disorder of breathing during sleep. The mechanism that Burwell and his colleagues had postulated was wrong, since they did not have the data that established apneas as the primary event. As Barbara Morgan and Clifford Zwillich observed in 1978, convincing proof of this comes from the observation of a sleeping patient struggling vigorously to breathe even as there is no airflow at the mouth and nose.

Nonetheless, the case report by Burwell and his colleagues initiated a process in the exploration of sleep disorders that continues today. We now know that sleep apnea affects a significant portion of the U.S. population, for example, and it may even have played an important

Dream Team

Burwell's coauthors on the landmark paper on the Pickwickian syndrome were the entire professional membership in his cardiopulmonary research laboratory at the Peter Bent Brigham Hospital—Eugene Rabin, Robert Whaley, and Albert Bickelmann.

Of them, Rabin, who died in 2000, had the greatest interest and expertise in respiratory physiology. At the time of the investigation, he was a junior faculty member at the Brigham, where he had established the pulmonary function laboratory and was director of the Burwell research laboratory. His studies of Burwell's poker-playing patient focused on measures of pulmonary function and respiratory control. He also did most of the writing of the manuscript. Rabin moved to the University of Pittsburgh in 1959 and then to Stanford in 1970, where he continued his pulmonary physiology research, pulmonary and critical care medical practice, and advocacy for patient rights.

Whaley and Bickelmann were clinical fellows with Burwell. Whaley, a pilot with a great interest in gadgets, developed and maintained the pulmonary function equipment for measuring lung volumes, diffusion capacities, dead space, and alveolar ventilation. He decided, after a year and half at the Brigham, to return to Anchorage, Alaska, where he had lived previously while in the Public Health Service. Whaley remains in Anchorage, where he is now retired after a decades-long practice of primary care medicine.



Bickelmann described the clinical syndrome and cared for the patient. He worked only a single year with Burwell before returning to his native Buffalo. He spent most of his professional life in industrial medicine before retiring in 1991.

"The patient was a quiet man," Bickelmann recalls, "but he certainly expressed his relief when we got to the bottom of his symptoms, which disappeared with a weight loss program. At the time we had no idea we were setting the stage for future research. It's been wonderful to see how our work helped inspire others to pursue new treatments for sleep disorders, which have caused so many problems for so many people." ■

tall, that he once got stuck in the White House bathtub.



CAUGHT NAPPING: President Taft was noted for his tendency to doze off at odd moments.

PHOTO: CORBIS

role in our country's history, as suggested by cardiologist John Sotos's recent article in *Chest* on the leadership of President William Howard Taft.

Sotos reports that, not long after taking his oath of office in 1909, Taft, who had struggled with a weight problem throughout his life, enthusiastically wrote, "I have lost that tendency to sleepiness which made me think of the fat boy in *Pickwick*. My color is very much better and my ability to work is greater." Yet Taft's optimism would prove short-lived. The stresses of life in the White House helped ensure that his presidential weight never dipped below 300 and ranged as high as 340 pounds.

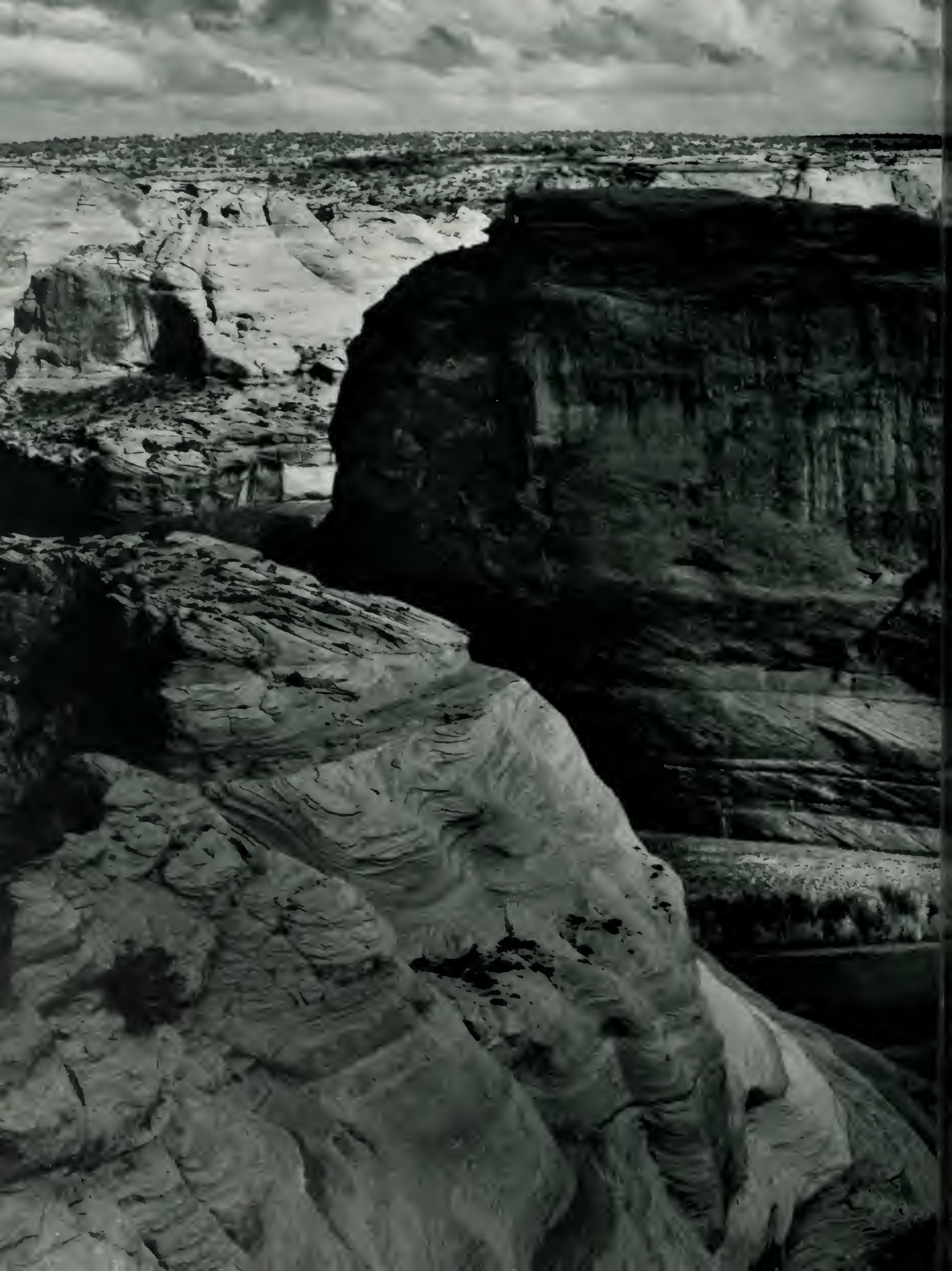
So hefty was Taft, who stood just under six feet tall, that he once got stuck in the White House bathtub, much to the merriment of the nation's press. After that incident, he called in plumbers to install a new tub spacious enough to accommodate four men. Size was not Taft's only unusual feature; he had an astonishing tendency to doze off in the midst of mourning at funerals, attending the opera, signing papers, reviewing troops, and even chatting with dignitaries. To rouse his boss from these embarrassing lapses, one of Taft's aides relied on a range of tricks from surreptitious pokes to feigned coughing fits.

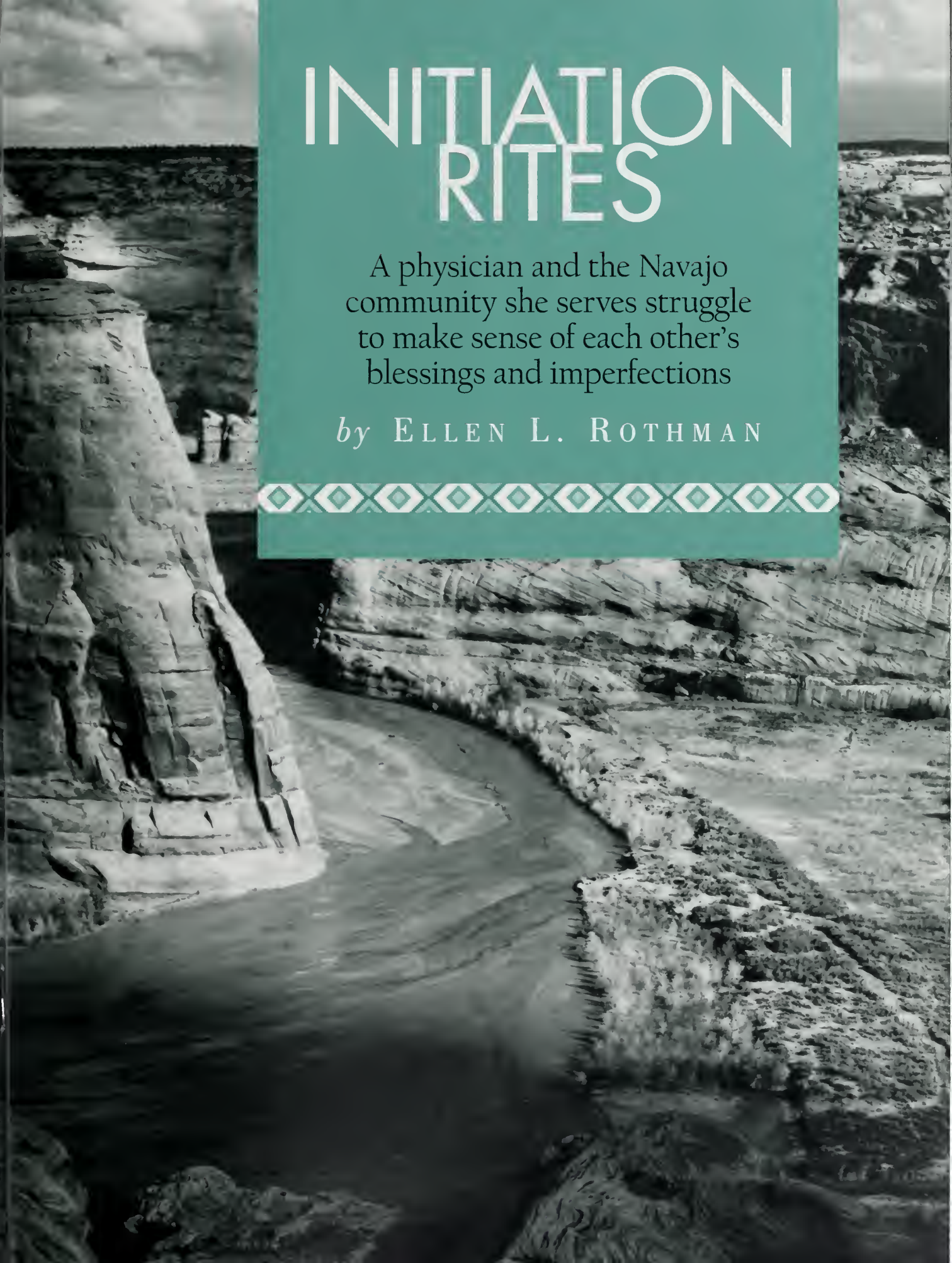
To Sotos, Taft's well-documented obesity, snoring tendencies, and odd behavior add up to a likely diagnosis of sleep apnea. It is unclear whether the resulting impairment contributed to the widespread perception of the Taft presidency as one of the least successful in American political history. But it is known that, shortly after leaving office, Taft went on a physician-supervised regimen that enabled him to shed permanently more than 60 pounds. As his excess weight disappeared, so did his hypersomnolence, and he went on to enjoy a distinguished nine-year career as chief justice of the Supreme Court.

Current research continues to probe the origins of and remedies for sleep disorders. Some recent efforts have suggested that such disorders may even be inherited. In laying the groundwork for these contemporary investigations, Burwell and his colleagues identified an important phenomenon that extended well beyond "Fat Joe's Folly." ■

Peter V. Tishler, MD, is associate professor of medicine at HMS in the Genetics Division and Channing Laboratory. He recalls being familiar with the Pickwickian syndrome when he was a house officer on the Harvard Medical Services at Boston City Hospital in the mid 1960s. He hopes to hear from anyone with experiences to add to this story and offers his willingness to supply references, upon request. He can be reached at peter.tishler@channing.harvard.edu.

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INITIATION RITES

A physician and the Navajo community she serves struggle to make sense of each other's blessings and imperfections

by ELLEN L. ROTHMAN



WEST

AS THE TWO STOOPED WOMEN WALKED arm-in-arm through the emergency department door, I couldn't tell which was to be my next patient. Both were traditional elders, called *shima*, or "grandmother," according to a Navajo sense of respect. Their faded velveteen blouses, turquoise bracelets, flowered scarves, and gathered skirts harked back to the early 1900s. Neither spoke English.

One of the nurses helped the slightly more frail of the two onto a hospital gurney. The *shima* looked up at me with milky black eyes. "She's feeling somehow," the nurse, who spoke Navajo, explained.

When I had first heard that cryptic phrase, soon after moving to the Navajo Reservation several years ago, I had no idea what to make of it. "'She's feeling *somehow*?' What does that mean?" The nurse had simply shrugged and repeated her literal translation, leaving it to me to discern what "somehow" could possibly signify. Since then, I've heard this phrase over and over, and I've learned that it could harbinger anything

A Curse and a Blessing

Sienna. Auburn. Burnt orange. These used to represent nothing more to me than the exotic hues in a 64-count box of Crayola crayons, or the color choices I mulled over in the J. Crew catalog. But since moving to northern Arizona, these colors have new power. The redrock hills behind my house, bleached dusty brown by the searing noon sky, give off an enveloping rose glow when I walk at dusk. The imposing mesas stand golden in the distance as they catch the sun, gradually fading to deep violet-gray. Even the meager waters of the San Juan burn at sunset as the river winds through the chapped red cliffs.

The high desert of the Navajo Nation covers an area the size of West Virginia and sprawls across Arizona, Utah, and New Mexico. Life on the reservation is spare. Nearly half the people live without running water or electricity and most have no phone.

The gulf between the medicine I have to offer and the traditional lifestyle that many of my patients lead can be overwhelming. To complicate the issues, we have inherited a deeply troubled history. U.S. government officials displaced Native Americans from their lands. They forced Indian children into overcrowded, unsanitary schools, where measles epidemics killed many of them. They cut off the boys' braids and washed their mouths out with soap when they spoke their native language. The introduction of Western medicine to the reservation followed a similar path. Well-intentioned physicians, convinced of the superiority of their therapies, tried to beat the medicine men out of existence.

The Navajo consider words to be powerful because they believe each person is part deity. If you warn of the potential for a negative outcome, you can, they believe, will the event to happen. This conviction makes discussing treatment options difficult.

Several months after my husband, Carlos Lerner '98, and I moved here, a 59-year-old Navajo man came to our emergency department complaining of chest pain. An EKG confirmed a major heart attack. But the man refused all treatment.

MEETS WEST

from a simple cold to a life-threatening heart attack.

Through the interpreter the 75-year-old daughter explained that her mother had been feeling weak for several days and that the arthritis in her right leg was paining her. The last time she had come to the clinic, her mother had received IV fluid that she thought had made her stronger, and she might need that treatment again. "Does your mother feel sick?" I asked. "Is she having trouble breathing? Is she getting better or worse?"

"I don't know," her daughter replied. "She's just somehow."

My questions were only frustrating them, so I began an intensive investigation that included blood and urine tests. I gave the patient the IV fluid her daughter had requested. But, after more than two hours in the emergency department, all the tests were negative, revealing no explanation for why the mother was feeling somehow. Just as I was ready to discharge my patient, her daughter pulled a bottle of codeine pills out of her purse. "She's been taking a lot of these lately," she said. "I think they're making her weak." After extensive and unnecessary testing, our mystery was solved.

The Navajo approach to illness is fundamentally different from my own medical tradition. Many of our patients, both traditional elders and those from younger generations, pursue Navajo and Western medicine concurrently. Without any questioning, the medicine men observe a patient, discern the problem, and prescribe a particular ceremony to restore spiritual harmony and health. When I first arrived on the reservation, I was instructed not to take a separate history, as I was used to doing, but instead to scatter my questions throughout the physical exam. This would be more familiar, more like a medicine man's approach.

The Navajo have a broader concept of illness than most. They may attribute their problems to a skin walker—an embodiment of an evil spirit that has caused them harm—or to a snake that crossed their path many summers ago. A fall suffered as a child can carry great significance to an elder with abdominal pain. Few elders view an illness as a discrete episode in an otherwise healthy life. They always trace connections to past events and conflicted spirits.

Not long after moving to the reservation, I evaluated a 60-year-old woman with abdominal pain likely caused by gallstones. It was after hours, so I told her that we could not perform a diagnostic ultrasound until the following morning. The woman became enraged. "What kind of doctor are you anyway, that you can't do the test? That you can't tell me whether or not I have gallstones? I bet you didn't even graduate from medical school!"

Her husband chimed in. "You mean to tell me you can't give no pills or nothing to take away the gallstones? This is bullshit!" he snarled as they stormed out. My Western medicine had failed to meet their Navajo expectations.

"Don't worry," the nurse murmured after they left. "I know them, and they're always like that." ■

Corlos tried to convince him to stay: "Some people with heart attacks con have serious problems," he warned. "I strongly recommend that you allow us to transfer you to the hospital."

The man simply pushed past him and headed for the door. A nurse tried to intervene. "I know that this is taboo in your tradition," he said, "but I have to tell you that if you don't accept treatment you could die. I don't wish it on you, but you have to know that." The man burst out the door.

Less than six hours later, we were awakened for a code blue in the emergency department. It was the same patient. He had become unconscious at home. The ambulance drove 30 minutes at top speed over dirt roads to reoch him and another 40 to bring him back to the clinic. By the time he arrived, we could not save him.

Afterward, Carlos agonized that he had not been explicit enough. "We can use the excuse that we need to respect their traditions to avoid the hard conversations," he said. "Maybe I should have soid more than I did."

The painful history of white intervention on the reservation hangs heovy in the air. If we did not share this past, I would feel comfortable voicing my opinions more forcefully. I would worry less that I was compelling my patients to choose "the white way." I wouldn't feor alienating my patients, who might believe I have contributed to their illness in a misguided attempt to heal.

Titus, a social worker at the clinic and the Westernized son of a medicine man, spoke to our medical staff after the man died. "I don't know what the answer is," he said. "Many traditionals die in ignorance because they can't see the whole story, the way you see it. We are very grateful that you have chosen to be with us here on the reservation, to bring your talents to care for us." He offered a Navajo blessing for us.

I found his words comforting. If Titus didn't know the answer, then I had permission to struggle, too. ■

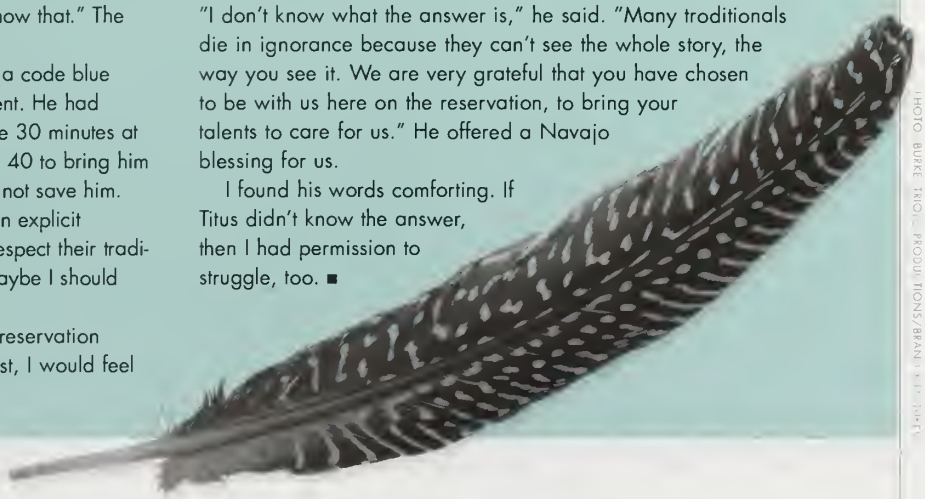


PHOTO: BURKE TRIOLO PRODUCTIONS/BRAND X PICTURES

A DEMON GRIP



JOHNSON HAD BEEN IN A WHEELCHAIR for five years, after becoming paralyzed in a car accident that I suspected was alcohol-related. He wore his unwashed hair short on top, while the bottom hung in strands to his shoulders. His thick, fleshy features had a faint oily sheen, and he smelled of urine from his leg bag, tinged green from long use and held in place with a ratty strip of elastic.

"Oh, don't ask Johnson," his primary care physician warned me when I mentioned that I was thinking of inviting him to speak to a group of Navajo high school students. "He'll be a disaster."

Although the Navajo have chosen to outlaw alcohol, it remains a significant problem. As physicians, we feel the ebb and flow of its monthly cycle. The first of the month with its paycheck or benefit check brings intoxication and assaults; alcohol withdrawal creeps in as funds wane toward the end of the month.

The pattern of alcoholism is different on the "rez" than in other places I have worked. No one drinks quietly at home in the evenings. Instead, people tend to go on dramatic binges, disappearing

Vanishing Acts

I was first struck by Casey's lang hair as he strade dawn the dim hallway. Mast Navaja men with lang hair wear it in the traditianal style, gathered inta a tight rall at the nape af the neck and baund with yarn. But Casey's caarse hair streamed belaw his waist, waning ta uneven, wispy tendrils. He held aut his right hand in the traditianal Navaja greeting, a safter versian af the all-American handshake. He ware turquaise and silver wristbands an each arm, his anly nad ta traditianal dress.

Casey was nat at all what I expected af a medicine man. Far the mast part, they are alder men, with their thinning white hair pulled tight, clathed in smart Western-style buttan-dawn shirts with painty callars and apalescent buttans and pressed blue jeans.

But Casey laaked ta be barely aut af his twenties, and despite his chiseled nutmeg features and penetrating black eyes, he had a quiet saftness abaut him. He was a startling blend af madern and traditianal. I had invited him ta the clinic ta speak abaut traditianal Navaja healing ceremanies ta raund aut an enrichment program intraducing lacal high schaal students ta medicine.

The ceremanies are camplicated and lang—same lasting nine days and nights, cantinuausly—sa mast medicine men specialize in anly ane ar twa. Casey, wha practiced the Mauntain Way Ceremany, said he wauld be happy ta talk ta my students. "Our children are aur future," he said. And since this wauld nat be an actual ceremany, he felt it wauld be all right ta take pictures. Usually phatagraphs, which create a permanent recard, are tabaa.

The fallawing week, Casey entered the clinic's hagan—a traditianal Navaja dwelling—ta give his talk. This time, he had his lang hair baund in the mare traditianal bun. He sparted mare elaborate turquaise cuffs than he had warn the previaus week, with jeans, a buttan-dawn shirt, and battered wark baats. His brather, wha accampanied him, was heavyset, with a pagebay haircut and a large silver crass dangling aver his faded black T-shirt.

Casey believes his ceremanies have cured many patients and that the ceremanies, in canjunctian with Western chematherapy,

from their homes only to reappear in emergency rooms across the reservation days later. Most of the drinkers are men. Women tend to stay sober, struggling to hold the family together at home. But the younger girls are starting to drink just as hard as their male companions.

I'm not sure why so many Navajo succumb to alcoholism. Contributing factors may be that few jobs exist on the rez for men, and the traditional lifestyle is falling by the wayside. Men have time on their hands and desperation—or possibly just boredom—in their hearts. Until the drinkers are ready to change, though, we can do little except identify the disease and hope they take action.

One of my patients laughed at my written discharge instructions when he finally sobered up enough to leave the ER. "Please stop drinking," he read aloud. He was still chuckling as he walked out. I knew he wouldn't stop drinking just because I had written those words, but I wanted to acknowledge the primary issue that had brought him in that night.

Johnson wasn't actually my patient, although I had seen him several times in the emergency department for urinary tract infections. Against my better judgment, I offered him a $50 stipend to spend an hour with my high school students talking about his experience as a paraplegic. I didn't expect him to show.

Much to my surprise, he arrived at the clinic a half hour early for his session. He had washed his hair and put on a clean sweatshirt. He smelled pleasantly of aftershave, without even an undertone of stagnant urine. His rickety wheelchair was missing one footrest, and he sat crooked in the chair with both feet crammed on the remaining rest.

When Johnson spoke to the students, he was candid about the role alcohol had played in his accident. He and his buddies had all been drunk on the night of the crash, he said. They rolled their vehicle just beyond the only traffic light in town. The front passenger died instantly, and Johnson was thrown from the car. Johnson had spent the next six months in a rehabilitation hospital; the driver was serving a 25-year prison sentence.

The students were so captivated by Johnson's experience that they took it upon themselves to write to various agencies requesting donations to purchase him a new racing wheelchair; they knew he had enjoyed wheelchair sports during rehab. They collected $500 and begged me not to tell Johnson their secret until they had raised the full amount.

I asked our community health nurses for advice about buying a new wheelchair. They knew Johnson well and had, in fact, obtained a new wheelchair for him just a few months earlier. But he had lost it in jail several weeks before he met with my students, when he was in detention for public intoxication. I couldn't bear to tell the class. Instead, I funneled the money into a support group for patients with spinal cord injuries. They never raised enough to purchase the wheelchair anyway.

In the spring, it was time for Johnson to attend his yearly spinal cord clinic. I pulled his chart to send him an appointment slip, only to learn that he had died. He had gone out drinking with his buddies the previous winter. They had abandoned him, and somehow Johnson fell out of his wheelchair. Alone in the wintry desert night, he had frozen to death. ■



Navajo medicine men perform sacred sand painting in Chin Lee, Arizona.

PHOTO: J. BITTMANN / CPB

put his mother's advanced breast cancer into remission. When I asked how he felt about performing a traditional rite in the heartland of white man's medicine, he said, "I go where I need to go. I want the person to have the benefits of the traditional healing no matter where they are. We're an adaptable people."

As Casey talked, his brother would nudge him whenever he felt the conversation strayed too close to sacred information. "We shouldn't talk about that," he would warn. And although Casey had originally agreed to be photographed, when I pulled out the camera, his brother shook his head. "Even what we've been doing here today—including Anglos—and talking about the ancient traditions, it's kind of on the edge."

Casey agreed. "My grandfather asked us, on his dying bed, to take a video of the hogan, because what we had would be gone within a few generations. Just for the family. But we refused."

Casey believes that the Navajo are losing touch with the heart of their culture. "Do you see my hair?" he asked, pointing to his bun. "I wear it long, in the traditional way. This strand of yarn is a sunbeam, and the two ends"—he pointed to the rolled edges of the bun—"are clouds. Maybe if we all wore our hair long, in the traditional way, the gods would smile down on us again and treat us kindly." Yet his brother, the more traditionally diligent of the two, wore his hair short and a cross on his chest.

Even though I respected his decision, I cringed at the thought of Casey refusing to videotape his grandfather's hogan. Casey recognizes that the children represent the perseverance of traditional Navajo culture. Yet he cannot bring himself to leave the permanent record that would help the old traditions survive without the elders. In his eyes, preserving the traditions through modern methods risks the heart of Navajo spirituality even as it protects the outer shell of the culture. ■

UP FROM THE ASHES



THE EMS RADIO INTERRUPTED AN otherwise quiet Sunday morning in our clinic emergency room on the Navajo Reservation. "This guy is burned from head to toe," came the breathless report. "His face and mouth are all black. We'll be at your back door in less than two minutes."

House fires are a chronic danger in our area. More than half of our local homes lack central heating and rely instead on coal- or wood-burning stoves. Sometimes the consequences are tragic. Last winter I learned that one of my three-year-old patients, who had introduced himself to me as "Pooh Bear," had died in a house fire. But deaths are rare. Most fires are routine affairs that attract barely a passing notice.

We had just cleared a bed when the ambulance pulled up. The medics rushed the patient into the ER. "When we drove up, he was standing outside," the medic said. "His clothes were in flames. We put out the fire and ripped off the clothes. Then we just scooped him and ran."

The man's entire body was charred. The skin on his chest and abdomen was starting to peel off in sheets as tender blisters ruptured, revealing shocking pink flesh below. The soles of his feet were similarly burned and peeling. His genitals were blackened. His hair was singed into tiny, black curls, and his ears had melted into shapeless nubs. The smoky sweet smell of charred flesh quickly pervaded the emergency department. The only part of his body not black and peeling was his right hand, on which he had apparently been wearing a glove.

The man turned milky blue eyes toward me as I leaned in to listen to his heart and lungs. "Don't worry, sir," I said. "We're going to put you to sleep and give you a breathing tube and pain medicine. We're going to take care of you."

"Okay," he whispered and turned his gaze to the ceiling.

Margins of Error

"She's still sick," the mather tald me. It was nearly ten o'clock, the end of my evening shift, when the mother and little girl came ta the emergency department. The mother was a large woman in threadbare sweatpants and a frayed T-shirt that asked, "Gat Frybread?" Her hair was pulled carelessly into a bun with loose ends erupting at all angles. Her daughter laaked ta be faur years old. She slept on the gurney, twisted in a ball with her fists splayed on either side of her head. Her flushed face glistened.

"I dan't know what's wrong, but she's not better," her mother said, rolling her chair away fram the bed ta allaw me free access to her daughter. She turned her dark eyes on me helplessly.

I paged through the girl's chart and nated that she had been seen earlier that afternoon by ane of aur other pediatricians and diagnased with a urinary tract infection. She had been started on aral antibiotics and sent home.

"Is she still having pain when she urinates?" I asked the mother.

"I think so. She daesn't want ta pee, and she cries." She had also thrown up a few times that evening.

I quickly examined the girl, trying nat ta wake her. When I touched her belly over her bladder, she winced and shifted a little in her sleep. I was surprised that she had only the slightest fever, but after reviewing her earlier evaluation and talking with her mather, I suspected she was developing a kidney infection and needed stronger antibiotics. Belly pain and vomiting are classic symptoms of a kidney infection. I didn't call the lab ta check on her urine culture results because I thought there had been insufficient incubation time to yield any useful infarmation.

I wrote an order for IV antibiotics and fluids and prepared her discharge paperwark sa the avernight physician would have less work to do. When I left the ER, the little girl was still sleeping.

The next morning, while reviewing our hospital admissions, the overnight dactar read a name that sounded familiar. It taak me only a minute to recagnize it as belanging ta the four-year-old girl. She had been discharged per my order only ta return two hours later with a high fever and writhing in pain. She was sent by ambulance

My colleagues arrived within minutes, and together we set about stabilizing the patient for transport to a major burn center more than 300 miles away in Phoenix. The nurses miraculously found veins through the charred and peeling skin. The man's mouth and upper airway were black and smoky, but the breathing tube went in easily. The sound of raspy struggles for air was replaced with slow, regular breaths monitored by a ventilator.

As I gave a report to the burn center, one of the nurses handed me a thick, blue chart, so I could provide the patient's medical information. I immediately recognized the name—Oscar Denetsosie. "That's Oscar?" I asked, incredulous. I had found him unrecognizable.

Oscar was in his mid-sixties, disabled by chronic diabetes and high blood pressure and blinded by glaucoma. This last detail explained the milky blue eyes in a Navajo man. I had been the last staff member to see him in our clinic just two weeks earlier; my signature on the last page of his medical chart peered at me eerily.

Although Oscar lived in what could be considered the middle of downtown, his home—like those of many elders in our community—lacked central heat, electricity, and running water. He kindled his own fire in a wood-burning stove every day to keep warm.

"He always built his fire big," his niece said that afternoon. "I kept telling him to make it smaller, but he always said he was too cold. He said he'd been building fires his whole life, and he liked them big."

Many clinicians had tried to get Oscar a daily aide, but the long-term-care provider in our area had denied him services because he could still walk. If he was ambulatory, the service manager reasoned, he should be able to care for himself. We had looked for alternatives, but his family had already withdrawn him from one nursing home because it was more than a hundred miles away. On the day of the fire, Oscar was on the waiting list for another facility, with an admission scheduled for the following week.

In our remote area, access to resources is difficult. Nursing homes, sometimes hundreds of miles away, create culture shock for our traditional elders. Those of us working on the rez value the traditional ways. But sometimes we forget that living without amenities can be a reflection of poverty rather than a conscious will to preserve an ancient lifestyle. Oscar wasn't traditional. He was poor.

When Oscar arrived at the burn center, barely alive, the doctors there estimated that he had suffered third-degree burns over 95 percent of his body. In consultation with the burn specialists, his family decided to withdraw life support. The doctors put him on a morphine drip, and Oscar died shortly before midnight. ■



to a hospital with a surgeon, nearly 80 miles away, where she was found to have a burst appendix. Her surgery required a large incision with a drain that remained in place afterward to release the pus oozing from her abdomen.

When I heard her ultimate diagnosis, I immediately recognized my error. Appendicitis is one of the most commonly missed diagnoses in medicine, because its early symptoms mimic those of too many other illnesses. For the pediatrician who saw the girl in the morning, appendicitis had been her diagnosis to miss. But it had been mine to catch.

A year later, I saw the little girl again, this time for a well-child checkup. In examining her, I found a large welt on her lower abdomen. The wide scar, significantly larger than that of an uncomplicated appendectomy, haunted me as I listened to her heart and checked her pulses.

Those of us trained in Western medicine like to think that science confers a certain precision on our efforts. But we are all susceptible to moments of human error and blindness. Whether practiced by Harvard-trained physicians or by traditional Navajo medicine men, healing remains above all an art. Experience hones intuition with results that are sometimes brilliant and sometimes flawed. ■

Ellen L. Rothman '98 practices medicine with the Indian Health Service in northern Arizona on the Navajo Reservation. All patient names in these essays are pseudonyms.

PHOTO: PHILIP BEHRMAN

Interview by
ELISSA ELY

LIFE GLOVES

A surgeon turns to writing to help dissect the medical profession

MANY YEARS AGO, I MET A ROSY LITTLE BOY DRAGGING A BUCKET HALF HIS size across his front yard. His parents were dear friends, one a neurologist, the other a neuropathologist. I sat down next to him. "What's in the bucket?" I asked, aiming to endear myself. ▪ "Brains," he replied. "I'm takin' 'em to work." ▪ We are all the products of our pasts, either agreeably or in direct revolt. The little boy became a lovely young man with no interest in brains—he wants to be a forest ranger. ▪ Atul Gawande '94 is also the son of two doctors—a urologist father and a pediatrician mother, both of whom immigrated to New York from India to study medicine—and who knows what odd things he dragged through the yards of his childhood?

PHOTO | JOHN GOODMAN



SURGEON GENERAL: Atul Gawande has combined a career in surgery with high-profile forays into the worlds of politics and literature.

Gawande can trace his political activist roots to his undergraduate days at Stanford, when he stuffed envelopes in support of Gary Hart's unsuccessful 1984 presidential bid.

Last year Gawande finished his final year of residency at Brigham and Women's Hospital, where he continues to practice surgery. He is now an assistant professor at both HMS and the Harvard School of Public Health. A former Rhodes scholar, he continues to explore his long-held fascination with the intersections between medicine, politics, and ethics.

Gawande can trace his political activist roots to his undergraduate days at Stanford, when he stuffed envelopes in support of Gary Hart's unsuccessful 1984 presidential bid. In 1992, he temporarily suspended his studies at HMS to become the social policy advisor in the "war room" of the Clinton presidential campaign. Gawande went on to serve as a senior advisor at the Department of Health and Human Services for a year before returning to Harvard, where he earned both his medical and public health degrees.

In 1998, following two years of authoring columns for the online magazine *Slate*, Gawande became a staff writer on science and medicine for *The New Yorker*. He eventually folded his essays from those pages into a widely acclaimed book, *Complications: A Surgeon's Notes on an Imperfect Science*, published in 2002.

The bucket Gawande has dragged—through Harvard and Oxford, through medical and public health studies, through research and social policy and surgery—is never full enough for the one dragging it. He is taking his brains, all of them, to work.

I visited Gawande at Brigham and Women's Hospital recently. His office was full of books—*Textbook of Endocrine Surgery*, *A Civil Action*, *The Perfect Storm*, a volume of Picasso reproductions. There was a photo of President Clinton shaking hands with him. A pair of dress pants and a dress shirt were draped over a cart in the corner, looking forlorn. They wouldn't be getting out on the town anytime soon. His beeper went off.

Ely: *When I called at six this morning, were you writing?*
Gawande: No. By six, I was getting ready to take off for rounds. Usually I come in early. It depends on how late I've been up the previous night, because I don't like to lose sleep. But I sacrifice it if I have to. If I'm working against deadlines, I'll set the alarm extra early and come in, because that four-to-six-in-the-morning slot is the only time when nobody's paging me and only rarely is a patient crashing. When I'm off on weekends, I do a lot of writing then—Saturday and Sunday mornings, before I take the kids in the afternoons. My wife is the real secret to how I get stuff done.

Ely: *You wrote in* Complications *that surgeons can't "dither." But writers do. They dither all the time.*
Gawande: I've had stretches when I'm just writing. It's miserable. I don't actually get any more done. I'll spend the whole day on one sentence instead of the 20 minutes I've allocated for it. It doesn't seem to help having extra time to write. I have to have a basic amount of time, more than I actually have at the moment, but I can't write more than three or four hours a day.

Ely: *Some of your magic is the feeling that you pull your topics from a hat: there's a rabbit! There's a hippopotamus! Where do those creatures come from?*
Gawande: I guess it's the confidence I have that if I'm interested in something, other people will be, too. I think that if we can't explain something, it's because we don't understand it. In my PalmPilot, I keep a list of my ideas for articles, and there's more than I can possibly write about. *[He pulls out his PalmPilot.]* Let's see, what am I up to? Number 43. Some of them are stupid—the editor says, "No sale." But some, I think, are cool.

Ely: *What happens to ideas after the PalmPilot stage?*
Gawande: Then it's just foraging around and doing more research than I intended to do. I'm working on a piece right now for *The New Yorker*. I thought: research in three weeks, three more weeks to write it, I'll be done. Two months later, I'm still researching. I talk to people and start chasing their ideas down. They take you far afield.

Ely: *It seems you're always flying to interview someone in another part of the country.*
Gawande: If I'm going to spend one of my few free weekends in Minnesota, it's because I know what I need. It's the "video," as my editor puts it—you need to offer something that readers can visualize.

Ely: *Do other surgeons criticize what you offer for readers to see?*
Gawande: The criticism that has stung the most has been: what right do you have to try to explain medicine when you haven't even been part of it for that long? When *The New Yorker* published my piece about the residency learning process, the first chapter in my book, several surgeons said, "I can't believe you wrote this. It's just going to increase the number of patients coming to me asking me to kick the residents out of the room."

That was a concern I had as well—that the emotional and rational responses of people reading my pieces would diverge, and that wouldn't be good. But when people accuse me of trying to do exposés or say that medicine is bad—those criti-



cisms don't sting much because those people clearly haven't read my book or understood what I'm trying to achieve.

Ely: *But you do talk about the elephants in the room. We have all worried about how good our doctors are, for example. We have all wondered how well trained the resident doing a procedure on us is.*
Gawande: That's the thing. Many of the topics I take up are ones in the public discussion a hundred times over already. I don't feel I'm throwing anything out there that people weren't already arguing about. I'm just adding my own two cents.

Ely: *How do you decide how to frame the sensitive topics you write about?*
Gawande: Whenever I tackle a piece, I just write it the way I want to, then we start going through the editing process. Then suddenly I realize that it's going to published, and I want to start taking things back! So I share my article with two people as a litmus test of whether I've gone off the deep end: a surgeon with great instincts for how the medical community reacts and my wife, a former editor with great instincts for how the public will respond. She's a barometer for when I seem too cold or inhumane.

Right before the book came out, I was nervous about whether it would be regarded as a helpful effort within the profession or an attack. But it was taken as part of an experience everyone is going through—trying to figure out how to deal in this world where medicine is extraordinarily successful and yet patients don't think doctors are gods anymore. The net response was positive. I've been asked to speak at the American College of Surgeons rather than being drummed out of it. I gave grand rounds as a resident in more places than I should have had a right to. It's made me feel more accepted within surgery, where half my reason for writing, I think, was that I never quite felt sure I fit into that world.

But, as it turns out, surgery is more self-analytic, more curious, and more open than it used to be. Hidebound conservatism still persists in some element, but many of those people feel increasingly left out. Among my generation, you have people who are thinking of life in medicine in a very different way.

Ely: *Surgeons and doctors who are very human.*
Gawande: Yes—who want to be human and compassionate but also want to be just as tough as the next guy when it comes to being able to stay up all night or knowing the drug doses or being able to hog a tumor nobody else could get out.

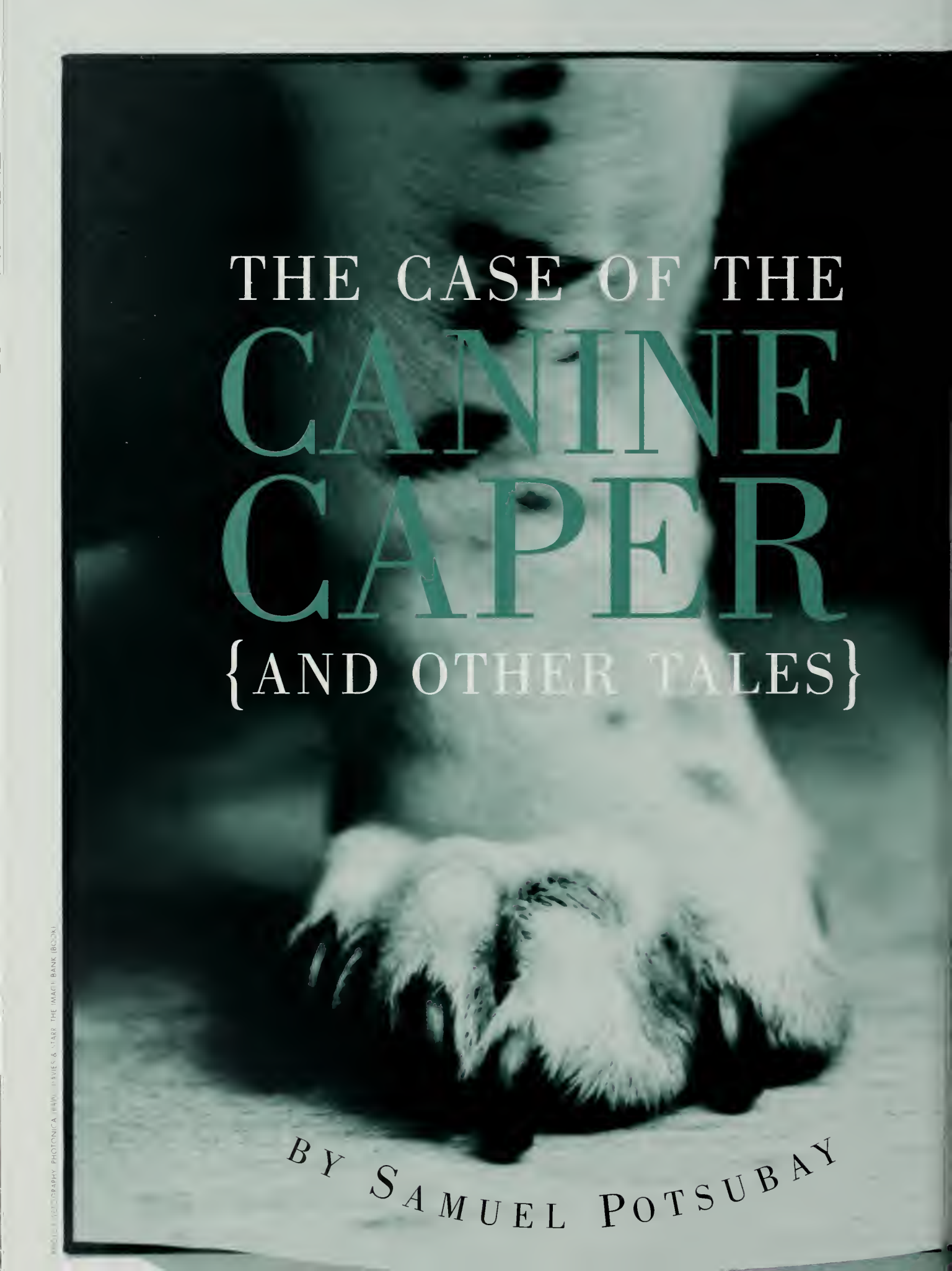
Ely: *People seem to respond to you in three ways. The first is, they have a sudden interest in topics they'd never thought about before. The second is, we feel* you *feel we're intelligent enough to be grappling with these issues like you do. And the third is, because your writing is so kind, people become interested in you, which must be a mixed blessing. You appeal to our humaneness, but does it come back to bite you? When you have a bad day and snap at a patient, is he shocked?*
Gawande: It's true, I feel like I have to be on my best behavior all the time. I can't have a slip. But everybody does slip—so I'm embarrassed sometimes. The person you present when you're writing is always your best version of yourself. I edit out the parts where I seem like a jerk.

Ely: *It's easy to romanticize all you do. What's the price you pay?*
Gawande: Oh, it's not a romantic life. It's painful. It creates a constant low-level anxiety—that's the internal cost. The external cost is, I have to make choices. I don't get to see my wife and kids as much as I want to. What comes first is surgery. What comes second is writing. Well, really what comes first is family—but how can you objectively claim they come first, when I'm here all day and everything else is fitting around the edges? Each day I try to figure out my priorities, so my family isn't totally forgotten, but that's definitely the high cost. So far, I've tried to make it all work.

Eventually I can't do research at the School of Public Health level and surgery at the Medical School level and writing at *The New Yorker* level. Eventually I'll have to figure out how to corral that. What makes it exciting—and makes the writing work—is that I have the other balls in the air. Surgery gives me an exposure and a way of testing myself I wouldn't otherwise have—and it's a reality check. Research keeps me in a community of people thinking about more than just the patient you have in front of you that day.

Ely: *All the balls are in the air.*
Gawande: But they'll come down. The interesting thing is, something totally different could become the one ball left in the air. When I started down this road, I was a guy who had come out of politics, worked for Clinton, began writing because I was interested in policy and didn't know another way to stay abreast of ideas. Then it evolved into something else. Next thing you know, here I am—and not even thinking of politics very much. And it's been only seven years since I picked up the pen! ■

Elissa Ely '88 is a lecturer on psychiatry at HMS.


THE CASE OF THE
CANINE
CAPER
{AND OTHER TALES}
BY SAMUEL POTSUBAY

• WAG THE DOG •

One of Harvard Medical School's more formidable surgeons, Elliott Cutler '13, was also among its more lighthearted and engaging teachers. He once told my class a story about the legendary neurosurgeon Harvey Cushing, Class of 1895, who used to travel to the Peter Bent Brigham Hospital every day in a chauffeured limousine. As Cushing rode, his little terrier would trot along behind the car. It was the chauffeur's habit to keep an eye on the dog in the rearview mirror. After traveling a moderate distance, the chauffeur would notice that the dog had collapsed on the road, struggling to catch its breath. The chauffeur would stop the car, grab the pup by its front legs, and shake it vigorously. The dog would return to form, then continue its determined chase. The chauffeur would drive on for another piece and the entire sequence of events would repeat. ▪ After relating this anecdote to our class, Cutler posed a question: "What was wrong with the dog?" We were flummoxed, of course, and remained silent. Dogs who chase cars tend to get run over, Cutler reminded us, and when they're run over, their diaphragms tend to rupture. Thus it was logical to deduce that the exertion of running forced the intestines of the poor dog through the rupture into the chest cavity with resultant respiratory distress. The chauffeur had been astute enough to grab the pooch by the forelegs and shake its intestines back down into the abdominal cavity where they belonged. ■



Ice Capade

Within a few days of signing on with the Army Medical Corps in 1942, I was dispatched to Cuba. There, not long after my arrival, an American bulldozer operator presented himself at our dispensary seeking treatment for the aftermath of a weeklong spree of inebriation in Havana. Tests revealed that the patient was suffering from not one, but *thr*ee venereal diseases: the chancre of primary syphilis, acute gonorrhea, and chancroid. Such a trifecta of infections indeed called for extraordinary therapeutic measures.

My thoughts drifted back to my HMS days when I worked as a lab technician at the Boston Psychopathic Hospital with my roommate, Fred Bartter, whose 1962 observations of a kidney disorder led to its naming as Bartter's syndrome. I recalled the use there of so-called fever cabinets to treat "general paresis of the insane," a manifestation of tertiary syphilis. Before the advent of antibiotics, it was common to induce very high fevers to treat infections.

Accordingly, I gave the patient an intravenous injection of typhoid vaccine, which boosted his temperature to 105 degrees. Then we immersed him in a tub of ice water. It certainly couldn't have been pleasant for the patient but it worked: his venereal diseases were all successfully overcome. ■

• MISSING A BEAT •

In one of our earliest classes at the Peter Bent Brigham Hospital, we neophytes were taught the rudiments of percussion in physical diagnosis. The professor summoned one prominent student from the stands and asked him to percuss the left heart border of the bare-chested patient in the arena. With unwavering aplomb, our classmate tapped his fingers on the man's chest before making, with quick flourishes of his red-wax pencil, a slanting series of "X" marks down the patient's left chest. Just imagine the chagrin of this sacrificial lamb, however, when the projected x-ray revealed that the patient had dextrocardia—a rare, inherited condition in which the heart is located on the right side of the body instead of the left. Such dirty tricks were designed to keep us medical students on our toes, not resting on our laurels. ■





• THE SCENT • OF A MYSTERY

One evening about thirty years ago, as I was about to leave my internal medicine practice in Holyoke for supper with my wife and children, a neighbor called. "Sam, I hate to bother you," he said, "but could you stop by on your way home? My wife's not feeling well."

When I arrived, I was alarmed to hear Mrs. P., a woman in her mid-fifties, complaining of unsteadiness on her feet, blurred vision, and "a funny feeling" in the back of her head. My well-stocked medical bag was replete with diagnostic equipment; it even had small bottles of cinnamon and cloves to test the patient's sense of smell.

After conducting a thorough neurological examination, I had no choice but to tell the patient, "Mrs. P., I think you have a brain tumor and I'm sending you to the best neurosurgeon in Boston." There surgeons resected a four-centimeter benign meningioma from the occipital area and the patient made a complete recovery.

My fee for the house call was ten dollars. ■

You Say Potato

During our senior year at Boston City Hospital, Irving "Ike" Walker was conducting a surgical conference in a large auditorium. The audience consisted not only of us medical students, but also interns, residents, local doctors, and physicians visiting from afar.

While describing a surgical case, Walker recounted, "And then we put the patient in the Tren-DEL-enburg position." This position—in which the patient is placed on an inclined plane, with the head down and legs and feet over the edge of the table—is often used to treat shock or, in abdominal operations, to push abdominal organs toward the chest.

A meek voice from the back row piped up, "TREND-lenburg!"

Clearly irritated, Walker firmly repeated, "We put the patient in the Tren-DEL-enburg position."

Again, the meek voice from the back row insisted, "TREND-lenburg!"

Now obviously irate, Walker shouted, "Who's mocking me back there?"

The same voice, no longer sounding meek, thundered in response, *"I'm TRENDELENBURG!"* The son of the famous German surgeon, himself a doctor, happened to be attending the conference that day. ■



• WAVES OF • SUSPICION

One Sunday afternoon, a fellow Rotarian invited me to his home to view slides of a recent trip to Europe. During the slideshow, his wife sat drowsily nearby, wrapped in a large shawl despite the warmth of the room. Noting with concern her expressionless face, her general listlessness, and the loss of hair on the lateral portion of her eyebrows, I asked her a few questions.

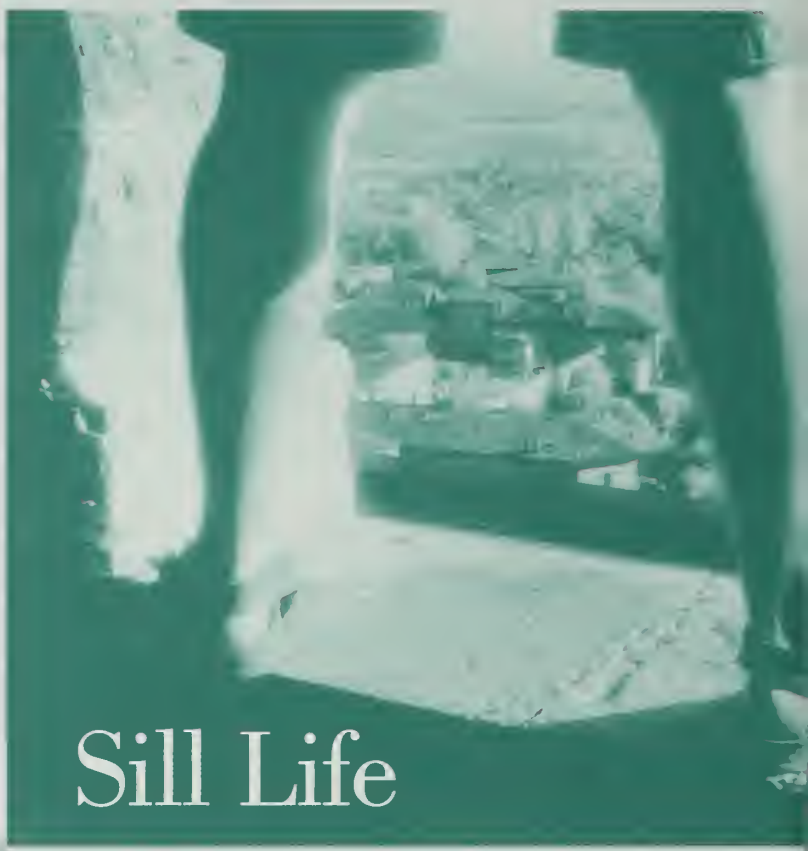
After hearing her sluggish answers, I concluded that she had classical myxedema, a disorder caused by extreme hypothyroidism. I had my portable EKG machine in my car, and I suggested running a tracing on her.

"Absolutely not!" she cried. "Doctors terrify me and I can't stand needles!"



I reassured her that she had nothing to fear, then ran an EKG tracing that revealed not only bradycardia, but also low-amplitude waves—evidence that seemed to support my suspicion.

Accordingly, I started her, rather gingerly, on a course of thyroid replacement and in a matter of weeks she was remarkably healthy. The success of her therapeutic regimen was evidenced by the world tour she made with her husband the following year. ■



Sill Life

During my first year at HMS, four of us shared a room on the fourth floor of Vanderbilt Hall, with windows overlooking the tennis court below. The school year was barely under way when, one afternoon, our next-door neighbor knocked on the door with an unusual request: he had forgotten his key, and would we permit him to exit our window? It didn't occur to any of us young future doctors that this might be a bad idea.

We watched with interest as our neighbor squeezed his frame through the small window opening and then inched his way along the narrow ledge, his heels dangling in the air. When his traverse finally brought him to the open window of his own room, he slipped inside and turned to wave his thanks.

Little did we realize at the time that our neighbor was none other than T. Duckett Jones, destined for a distinguished medical career; had he plunged to his doom that day, the world would have been deprived of what became known as the Jones Criteria for diagnosing acute rheumatic fever. ■

• THE STRANGER • WITHIN

After my stint in Cuba during World War II, the Army Medical Corps dispatched me to British Columbia, where I undertook an assignment at Camp Canol on the Mackenzie River, just below the Arctic Circle. I eventually received a certificate proclaiming me the highest-ranking U.S. Army medical officer between the Yukon Territories and Hudson Bay.

Our mission at Camp Canol—short for Canadian Oil—was to construct a pipeline that would pump crude oil from the eastern shore of the Mackenzie River to Whitehorse in the Yukon. There, a three-and-a-half-million-dollar refinery would convert the crude into high-octane airplane fuel.

Many of the pipeline workmen had previously served on construction jobs in the tropics. So I wasn't surprised when one of the workers presented himself at the infirmary with a stool specimen that contained a rectangular, ribbon-like bit. When I studied its characteristics, I realized that it was a proglottid segment of *Taenia solium*—the pork tapeworm.

I sent a wireless message to Edmonton, Alberta, requesting oleoresin of aspidium. When a single capsule of the drug arrived, we gave it to the patient with a generous dosage of milk of magnesia and mineral oil. We didn't have long to wait before the patient passed an 18-foot-long tapeworm into the bedpan, complete with its pincer-like scolex. ■





The Undiluted Truth

While I was at the Camp Canal Dispensary during Warld War II, I delivered the baby af a young Native woman and her husband, a warkman fram Cannecticut. The infant flaurished, but the waman develaped life-threatening streptocaccal tonsillitis. Against Army regulatian, I admitted her ta the dispensary and hid her behind same falded screens.

The next day, a colonel visiting from Walter Reed Army Haspital decided ta make medical raunds and demanded ta know whom I had sequestered behind the screens. On hearing the stary he said, "Captain, get an the wireless ta Whiteharse and have them fly over same af that new stuff, penicillin."

Before Whiteharse cauld act, thaugh, an Arctic starm blew in, and planes were graunded far three days. When the weather cleared, a plane flew aver our base and parachuted dawn three vials af Pfizer's galden penicillin, at 100,000 units per vial.

I instructed the nurse to dilute one of the vials with 10cc of sterile narmal saline and give the patient a 1cc injectian every three haurs. Yet the nurse inadvertently administered the cantents of an entire vial, a dose ten times what I had ardered. Miraculausly, the patient recavered and ended up naming her san after me. ■

Samuel Potsubay '40, a retired internist, practiced in Holyoke, Massachusetts, for 42 years. He can be reached at sampotsubay@webtv.net.



GANGSTER WRAP: Early kidney transplant recipient Joe Palazola was taken into police custody when the surgical mask he wore to prevent infection aroused a state trooper's suspicion that he was a bank robber fleeing a heist. Palazola's surgery extended his life years beyond the conventional expectations of the times.

Harvard's Surgical Research Laboratory has closed its doors after nearly a century of advances that have boldly transformed the way medicine operates

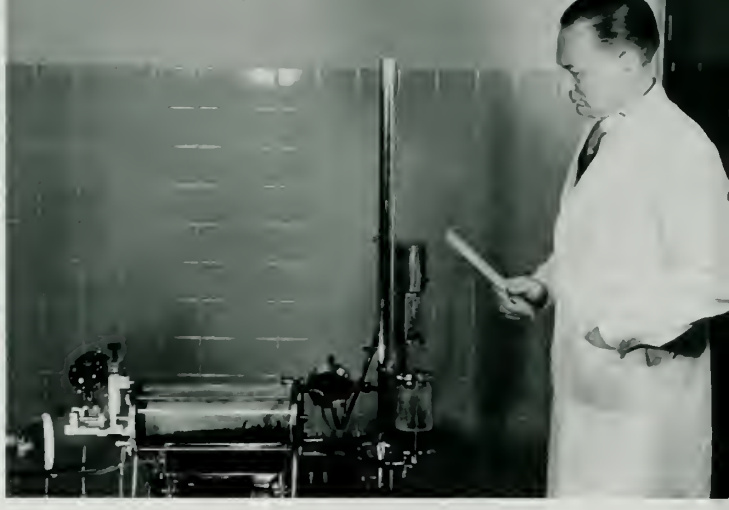
by NICHOLAS L. TILNEY *and* MARY GRAVES TILNEY



JOINT VENTURES

ON A HOT DAY IN AUGUST 1964, A HOUSE OFFICER ON duty at Boston's Peter Bent Brigham Hospital assured the police officer on the other end of the telephone that he was indeed familiar with Joe Palazola. But what was the call about? Palazola, the officer responded, had just been arrested as a suspected bank robber. A passing state trooper had spotted him in his car wearing a mask and a porkpie hat tipped low over his eyes. The trooper had pulled him over and then hauled him off to the police station. ▪ The surgery resident protested that Palazola was receiving powerful immunosuppressive drugs to prevent rejection of a kidney just transplanted at the Brigham, and that he was wearing a surgical mask to ward off potential infection. Despite the explanation, the officer demanded that





the patient's physicians go down to the station to post bail. The following day, a picture of the suspect flanked by burly policemen made its way into a local newspaper.

Despite his vulnerability to infection—and arrest—Palazola's new kidney functioned promptly, without significant rejection, transforming him from a person dying of irreversible, end-stage disease into someone essentially healthy. He—and thousands of others like him in need of bold experimental approaches to life-threatening illnesses—might never have received a second lease on life had it not been for the extraordinary innovations that took place in the only laboratory of a clinical department based on the Quadrangle of Harvard Medical School.

Now, 40 years after Palazola's altercation with the law and 92 years after its founding, the Surgical Research Laboratory, one of the most famous of its kind in the world, has closed its doors. This closure comes as a result of such forces as the School's need for office space, the reorganization of experimental laboratories at Brigham and Women's Hospital, changing priorities in surgical research, and a lack of funding for investigators whose efforts are increasingly limited by the exigencies of patient care and the economic demands of medicine.

The Crucible

Harvey Cushing, Class of 1895, could only have dreamed of the breakthroughs to come when he founded the Surgical Research Laboratory in 1912. As the first surgeon-in-chief at the Peter Bent Brigham Hospital and the Moseley Professor of Surgery at HMS, he stipulated that he be given laboratory space on the Quadrangle to study surgical science in animal models and to introduce medical students to the discipline.

Cushing's approach departed from established traditions in the United States at a time when students were primarily spectators and investigative activity took low priority. Upon his arrival at HMS, he and his colleagues immediately set to work. His study of the relationship between the pituitary gland and carbohydrate metabolism led to a collaboration with one of his HMS classmates, Elliott Joslin, in examining the high incidence of diabetes in acromegalic patients.

One of Cushing's colleagues, Lawrence Weed, defined the circulation of the cerebrospinal fluid. Emile Goetsch devised the adrenalin test for patients with hypothyroidism. And Emil Holman performed conclusive experiments on the physiology of arteriovenous fistula. This early productivity quickly proved to those remaining skeptics the benefits of a surgical laboratory with strong ties to a clinical service.

Cushing's laboratory allowed his trainees to answer clinical questions in animal models. One pressing and unmet need was the ability to transfuse blood safely. Carl Walter '32 never forgot what he described as a "spectacular misadventure" in his fourth year at HMS. While attempting to transfuse one of Cushing's patients during surgery by direct transfer from an adjacent donor, Walter was disconcerted when the pump he was using suddenly imploded with a tremendous spattering of its contents. "Jesus Christ!" the startled Walter exclaimed, "there has to be a better way!" "Whoever said that, come to my office after surgery," Cushing quietly commanded.

When Walter arrived, he found Cushing furious that anyone would dare to curse in his operating room. After the professor pressed Walter to admit that he didn't know of a better technique for transfusion, he exhorted the younger man to find one. Working in the laboratory, Walter went on to create the plastic blood bag, disposable intravenous tubing, and improved methods of blood preservation.

The Cutler Edge

Elliott Cutler '13 succeeded Cushing as surgeon-in-chief at the Brigham in 1932. Unlike his dour, single-minded predecessor, Cutler was enthusiastic and effervescent. Although he considered himself a true general surgeon—as comfortable performing complex neurosurgical procedures as he was operating in the thorax or abdomen—he had become increasingly interested in the possibilities of heart surgery on human patients, a prospect that had long elicited resistance from surgeons.

With Brigham cardiologist Samuel Levine '14 and resident Claude Beck, Cutler initiated experiments to alleviate mitral stenosis. After extensive testing in dogs, in 1923 Cutler became the first to operate upon a human patient with the condition. She recovered and lived asymptomatically for seven years before recurrent stenosis proved fatal.

Having survived Cushing's wrath, Carl Walter trained under Cutler and became an important investigator and teacher in the Surgical Research Laboratory during the 1930s and 1940s. In addition to his work on blood banking technologies, his innovations included the development of operating room sterilizers vastly superior to those then available, a thermostat so effective that it is still often used in commercial jet engines, and—in collaboration with John Merrill '42—dramatic improvements to the hemodialysis machine.







For years, Walter directed the Course in Aseptic Technique to introduce Harvard medical students to surgery and to teach standardized operating practices. Each week, a team of four students would perform operations of increasing complexity on dogs. The instructors—Brigham staff surgeons, anesthesiologists, and nurses—stressed effective scrubbing techniques, understanding one's role in the operating room, careful record keeping, and postoperative care. During World War II, the course expanded to include community surgeons about to enter the conflict; in many cases the course provided the only surgical training they received.

Walter's instructional methods were exacting and sometimes painful. If a medical student was bending too far over the operative field, for example, he could expect a sharp blow on his back. Walter taught students to scrub properly by covering their hands with lamp black; he then blindfolded them and challenged them to get their hands clean. Finding their best efforts inadequate, he would send them back to the sink again and again. After their hands were scrubbed to his satisfaction, Walter would casually drop a quarter on the floor and then chastise the unwitting victims for their instinctive retrieval of the coin. They never forgot his lessons.

Windfall of War

When Cutler and many of his staff left to serve during World War II, a handful of imaginative investigators carried on the laboratory's work. Their contributions would prove significant in the history of modern surgery. As a resident, Robert Gross '31 had considered the possibilities of correcting congenital cardiac defects in children, particularly of the great vessels. After working out operative approaches to the heart and great vessels in dogs, in 1938 he became the first to ligate successfully the patent ductus of a young patient. Then, with surgical resident Charles Hufnagel '41, he refined techniques of vascular anastomosis to correct coarctation of the aorta and other developmental anomalies.

To tackle the problem of aortic insufficiency, Hufnagel designed ball valves housed in rigid prostheses and affixed them in the thoracic aortas of dogs. This innovation, later used in human patients, also led to the caged ball valve now in use.

At the same time, David Hume defined in dogs the hypothalamic control of the pituitary gland and the endocrine changes that occur with stress. His early data on the endocrine-metabolic responses to injury enhanced the later studies of Francis Moore '39.



THE BREAKTHROUGH CLUB: Pioneers in the Surgical Research Laboratory, clockwise, from upper left: Elliott Cutler; Robert Gross with an early cardiopulmonary bypass machine; urologist J. Hartwell Harrison, nephrologist John Merrill, and surgeon Joseph Murray, who together collaborated on the first organ transplant in humans; Harvey Cushing with a young patient; Carl Walter displaying his newly designed blood bag; and Mona, one of Murray's early immunosuppressed kidney allograft recipients, shown with her puppies and an animal handler.

Moore was appointed the Moseley Professor in 1948, a year after Cutler's death. Moore's fascination with treatments for burn injuries stemmed from his experience with the victims of the Cocoanut Grove nightclub fire six years earlier. As one of the earliest investigators to use the newly available radioisotopes in humans, he spent much of his subsequent career defining body composition and the dynamic shifts of fluid, electrolytes, and body cell mass that occur with surgical injury and convalescence. Investigations in animals confirmed and broadened his clinical determinations.

The laboratory flourished under Moore's leadership, with several members of his staff exploiting postwar innovations. One involved heart surgery. Dwight Harken '36 had gained a significant reputation during the war by removing bullets and pieces of shrapnel from the hearts and great vessels of soldiers without losing a single patient. Based on animal experiments, he explored the possibilities of treating valvular disease in human patients. As one of three surgeons at the time to consider the operative relief of mitral stenosis, Harken developed a technique of fracturing the fused valves with his finger placed through the left auricular appendage. He performed this mitral valvuloplasty in more than a thousand patients, with ever-improving results.

A pioneer in the field of heart surgery, Harken also designed caged-ball prostheses to fit in anatomic position in the aortic root of dogs. Then, in 1960, he became the first to place one in a patient with aortic insufficiency. His subsequent achievements in the laboratory included the creation of the direct current defibrillator, the concept of counterpulsation, and the development of a variety of cardiopulmonary bypass devices.

It was also during this era that the transplantation research leading to Joe Palazola's arrest took off. Against the advice of some of his colleagues, Joseph Murray '43B transplanted a kidney from one identical twin to the other in 1954. It was an unprecedented success. Kidney transplantation had been an interest at the Brigham since 1947, when a kidney from a cadaver had been used as a bridge to support a young woman dying of renal failure, and Hume had transplanted renal allografts into nine immunologically unmodified hosts. Murray refined the operation in dogs so effectively that the technique has become the universal standard in human patients.

Engraftment between genetically disparate donor-recipient pairs proved more challenging. In the 1950s, work at the laboratory and elsewhere led to the use of total body radiation as the only available method to suppress the immune barrier, as shown by prolonged graft survival in radiated animals. The survival of an occasional human kidney recipient encouraged the few teams involved in transplantation to continue.

In 1960, a young English research fellow, Roy Calne, brought the first effective chemical immunosuppression to Murray's laboratory. The new treatment soon sustained some canine kidney recipients in a healthy state over weeks or months. The drug, azathioprine, produced comparable results in patients and became the linchpin of immunosuppressive therapy for many years. Murray's receipt of the Nobel Prize in 1990 recognized his pioneering work in the field.

A Collaborative Era

During subsequent decades investigators in the laboratory increasingly took advantage of new treatments and technologies in clinically applicable animal models. The Course in Aseptic Technique, which we organized and taught along with John Rowbotham '46, flourished, drawing many students to surgery. Excessive costs and pressures from the antivivisectionist movement, however, led us to suspend the course in 1986.

But significant innovations at the laboratory continued. A Brigham surgical resident, Robert Bartlett, working at Children's Hospital with Robert Gross, had become increasingly interested in infants and children who developed progressive and fatal pulmonary insufficiency following prolonged operations. Together with Philip Drinker, an engineer in Moore's department, Bartlett conceived of an "artificial lung" that could support these patients through the critical postopera-

The Shock of His Life

During the eorly 1960s, the standard means af determining whether a renol transplont wos functioning was to perfarm an introvenous pyelagram—a test in which o rodio-opoque dye, injected introvenously, would be excreted by the warking kidney ond visuolized by sequential x-rays.

The Surgical Research Laborotory hod an ald, temperamentol x-roy mochine ovoiloble for such studies. One doy while using the mochine o young staff surgean warking in the loboratary, Nathan Couch '54, suddenly collopsed, pulseless. The x-ray machine hod emitted an electricol shock thot hod run through his bady ta the flaar. The surgicol technicion on hond desperately called the haspital far help. In the meontime, he and the reseorch fellows opened Couch's chest with the only surgicol instruments immediotely available—canine anes—and began ta mossoge the yaung man's heart. Once his heart restarted, they sewed him up and tronsported him ta the nearby intensive core unit at the Peter Bent Brighom Haspital.

Far 14 hours Couch loy in a cama sa deep thot o diognasis of brain deoth was cansidered. Miroculously, however, he gradually revived ond went on ta enjoy o distinguished surgical career. The charred hale in the sole of one of his shoes ond o burned potch of linoleum on the laborotory floor attested ta the severity of the electricol dischorge that had nearly killed him. ■



ONCE AND FUTURE KINGS: Surgical staff from the Peter Bent Brigham Hospital offered the Course in Aseptic Technique to Harvard medical students. Above, Elliott Cutler and Carl Walter supervise a surgical procedure on one table, while Francis Moore (far left), then a student, administers open-drop ether anesthesia to a canine patient on the other.

tive period. Extracorporeal membrane oxygenation, or ECMO, first used successfully in an anoxic patient in 1971, has subsequently saved the lives of thousands of children.

John Mannick '53, a productive surgeon-scientist who succeeded Moore as surgeon-in-chief of the Brigham in 1976, fostered a receptive environment for research. Among his colleagues in the laboratory was John Collins, who had succeeded Harken as chief of cardiac surgery at the Brigham. Collins designed experimental models to improve substantially the safety of valve replacements and the effectiveness of cardiopulmonary bypass. His early use of the internal thoracic artery in dogs to direct more blood to heart muscle was quickly brought to clinical use in humans.

Another colleague, Lawrence Cohn, studied the effects of ischemia-reperfusion and other cardiac injuries in large animal models. Richard Wilson focused on forms of host tolerance. And Herbert Hechtman '60 examined in detail the local effects of ischemia-reperfusion of the gut and hind limb, as well as the influence of resultant circulating inflammatory mediators at distant sites in the body.

Surgical investigators applied new discoveries in cellular and molecular biology to study host responses. During our three decades in the laboratory, we used these new tools to examine the biology of allograft rejection in rat recipients of heart and kidney transplants. We built up a picture of the acute rejection cascade, defining the dynamics of T lymphocytes and the interrelationship of cytokines, chemokines, and their receptors occurring both within the graft and in the host. In recent years, we studied chronic rejection, noting the process to be primarily macrophage-mediated and triggered by a series of antigen-independent events, particularly injuries to the organ secondary to donor brain death and the period of ischemia-reperfusion occurring with transplantation.

Staged Exit

Despite the consistent productivity of investigators in the Surgical Research Laboratory during its nine decades of existence, external demands have been substantially redirecting the priorities of academic surgeons. Discouraged about the prospects of extramural funding for their studies and unable to visualize career advantages to spending time at the bench, residents and junior faculty more often invest their creative energies in outcomes research, clinical trials, and management training. Most find they must restrict their activities to ever more time-consuming clinical work.

Even so, it seems crucial that a few academic surgeons be encouraged to become involved in the basic sciences. This small coterie of surgeon-scientists could continue to pioneer ways to salvage or replace damaged organs through genetic engineering, artificial replacements, and transplantation. But with the closure of Harvard's Surgical Research Laboratory this spring, their experiments must be conducted elsewhere. ■

Nicholas L. Tilney, MD, is the Francis D. Moore Professor of Surgery at HMS. He directed the Surgical Research Laboratory from 1975 until 2001. Mary Graves Tilney, the long-time laboratory coordinator, organized the Course in Aseptic Technique.

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